Office Use Only: PP#

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

Institution Submitting Proposal	Community College of Baltimore County

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: ◉ Yes ○ No | Payment Type: ○ R*STARS # ◉ Check # 10049213 | Payment Amount: $250 | Date Submitted: 05/01/2025

Department Proposing Program	School of Business, Technology and Law
Degree Level and Degree Type	Associate of Applied Science
Title of Proposed Program	Network Technology, General Networking Area of Concentration
Total Number of Credits	60
Suggested Codes	HEGIS: 519903.00 CIP: 110901.0000
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: 2025
Provide Link to Most Recent Academic Catalog	URL: https://catalog.ccbcmd.edu/index.php
Preferred Contact for this Proposal	Name: Dr. Laura Cripps Title: Assistant Dean, Curriculum and Assessment Phone: (443) 514-6755 Email: lcripps@ccbcmd.edu
President/Chief Executive	Type Name: Dr. Sandra Kurtinitis Signature: S Kurtinitis Date: 4/2/25 Date of Approval/Endorsement by Governing Board: 02/26/2025

Revised 1/2021

CCBC
The Community College of Baltimore County

443-840-CCBC (2222)

CCBC Catonsville
800 South Rolling Road
Baltimore, Maryland
21228

CCBC Dundalk
7200 Sollers Point Road
Baltimore, Maryland
21222

CCBC Essex
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CCBC Randallstown
at The Liberty Center
3637 Offutt Road
Randallstown, Maryland
21133

The incredible value of education.

www.ccbcmd.edu

March 31, 2025

Sanjay Rai, Ph.D.,
Secretary
Maryland Higher Education Commission
217 E. Redwood Street
21st Floor Baltimore
MD 21202

Dear Dr. Rai,

The Community College of Baltimore County (CCBC) is requesting approval of a substantial change to an existing degree program; the Associate of Applied Science (A.A.S.) in *Network Technology; General Networking Area of Concentration.* (HEGIS: 519903 and CIP: 110901).

The revised curriculum better prepares students with the emergent knowledge and skills necessary for setting up, managing, and maintaining cloud and network IT infrastructure. These include the addition of specialized coursework in AWS cloud certification, and Linux+ certification. As businesses increasingly rely on cloud services and robust network systems to operate efficiently around the clock, the substantial changes to this program prepare students for immediate entry into the workforce.

The revisions are reflected in red, below. The overall credit count for the A.A.S. is unchanged.

Network Technology (General Networking Area of Concentration), A.A.S. (Old)			**Network Technology (General Networking Area of Concentration), A.A.S. (New)**		
General Education Requirements			**General Education Requirements**		
ENGL 101	College Composition I	3	ENGL 101	College Composition I	3
Gen Ed Elective – Arts and Humanities	CMNS 101 recommended	3	Gen Ed Elective – Arts and Humanities	CMNS 101 recommended	3
Gen Ed Elective – Information Technology	CSIT 101, CSIT 111 or CSIT 120 recommended	3	CSIT 111	Fundamentals of Logic and Design	3
Gen Ed Elective – Biological and Physical Sciences	BIOL 108 recommended	3-4	Gen Ed Elective – Biological and Physical Sciences	BIOL 108 recommended	3-4
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Gen Ed Elective – Social and Behavioral Sciences	PSYC 101, SOCL 101 or CRJU 101 recommended	3	Gen Ed Elective – Social and Behavioral Sciences	PSYC 101, SOCL 101 or CRJU 101 recommended	3
Total General Education Requirements		**18-20**	**Total General Education Requirements**		18-19
Program Requirements			**Program Requirements**		
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DCOM 217	CCNA I: Introduction to Networks	4	DCOM 217	CCNA I: Introduction to Networks	4
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Total Program Requirements		36	**Total Program Requirements**		42
Program Electives			**Program Electives**		
Program Electives	Any CSIT or DCOM course(s)	6	None		0

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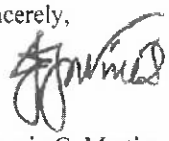
of Baltimore County

Total Program Electives	6	**Total Program Electives**	0
Program Total	**60**	**Program Total**	**60**

This proposal has been approved by Senior Staff and CCBC's Board of Trustees in February 2025. A payment of two hundred and fifty dollars ($250) has been forwarded to cover the substantive fee for a new academic program. Please feel free to contact me with any questions.

Sincerely,



Joaquin G. Martinez, Ph.D.
Provost and Vice President for Academic and Student Affairs

cc: Jennifer Kilbourne
Laura Cripps
Jane Mattes
Noell Damron
Lynn MacLaughlin
Ginny Zawodny
Glenda Breaux

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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.

The Community College of Baltimore County (CCBC) transforms lives by providing accessible, affordable, and high-quality education that prepares students for transfer and career success, strengthens the regional workforce, and enriches our community. Community College of Baltimore County Strategic Plan, FY2024-2026.

Substantial revisions to the existing Associate of Applied Science (A.A.S.) in Network Technology, General Networking Area of Concentration prepare students with essential knowledge and practical experience in setting up, managing, and maintaining cloud and network IT infrastructure. As businesses increasingly rely on cloud services and robust network systems to operate efficiently around the clock, the substantial changes to this program prepare students for immediate entry into the workforce and for improved transfer to four-year university programs.

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

Transformational Academics is a pillar of CCBC's 2024-2026 strategic plan. Within this pillar, among other objectives, CCBC seeks to increase the accessibility of education for students and support their transition into high-paying jobs. The substantial changes reflected in the A.A.S in Network Technology, General Networking Area of Concentration align with CCBC's strategic plan of "transformational academics" by providing a comprehensive and innovative approach to education and training that prepares students to effectively manage and maintain cloud computing and network systems. This revised program focuses on transforming academic methods to better align with the rapidly evolving technological advancements within workforce positions, including new courses in Foundations of Cloud Technology, DevOps Foundation and Implementation, and AWS Certified Cloud Practitioner. This program will also support CCBC's strategic priorities of economic stabilization and enrollment growth by cultivating expertise in local and regional cloud and network system administration.

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.

The proposed program is a substantial modification to an existing Associate degree program within the department of Network Technology. As such, the program will continue to benefit from the existing extensive resources of the department; including one full-time Chair of the department, five full time faculty members, and one administrative assisstant who serves the students and faculty connected with this and related programs. Dedicated computer labs for network and cloud technology are located on the Essex, Catonsville, and Owings Mills Campuses. In addition to the labs, CCBC students have full time remote access to a virtual computer with all necessary tools using the CCBC Virtual Desktop Infrastructure.

In addition to existing college funding, the department also utilizes Perkins grant revenue for program development, faculty training, and software and hardware needs. Recently, we were awarded an American Association of Community Colleges (AACC) grant of $20,000 to advance faculty career development.

CCBC consistently submits grants to fund future programs, faculty training, and equipment needs. As a result, we have secured sufficient funding to ensure the continuation of programs for at least the next five years.

4. **Provide a description of the institution's a 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 proposed program has been approved by CCBC's College Senate, president and Board of Trustees; thus adequate funding is in place for at least the first five years of program implementation. The program will continue, allowing ample time for student completion.

The proposed program is a substantial modification to an existing existing Associate degree program within the department of Network Technology. As such, the program will continue to benefit from the existing extensive resources of the department; including one full-time Chair of the department, five full time faculty members, and one administrative assisstant who serves the students and faculty connected with this and related programs. Dedicated computer labs for network and cloud technology are located on the Essex, Catonsville, and Owings Mills Campuses. In addition to the labs, CCBC students have full time remote access to a virtual computer with all necessary tools using the CCBC Virtual Desktop Infrastructure.

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

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

The network technology landscape is continuously evolving, with new tools, platforms, and methodologies emerging regularly. Staying updated with these advancements is crucial to maintaining efficient and secure network systems. As more businesses and organizations migrate to cloud-based solutions, there is a growing need for professionals skilled in cloud computing and network administration to design, implement, and manage these infrastructures. With the dramatic increase in risk from cyber threats, having advanced knowledge and skills in network security and cloud infrastructure is essential to protect sensitive data and ensure the integrity of network systems. Advancing and evolving knowledge in cloud and network system administration is essential to keep up with technological progress, meet market demands, enhance security, and drive innovation and efficiency in network management.

The 2022 Maryland State Plan for Higher Education identifies three primary goals for postsecondary education in Maryland; Access, Success and Innovation. The proposed program supports the goals of Access and Success by 'ensuring equitable access to affordable and high-quality secondary education for all Maryland residents' and in 'promoting and implementing practices and policies that will ensure student success'. Specifically, this proposal supports Priority 5 'to maintain the commitment to high-quality postsecondary education in Maryland'. Providing advanced education in cloud and network system administration aligns with these goals by bridging the digital divide and offering CCBC's diverse student body access to high-demand technical skills and career opportunities in the technology sector. This inclusivity helps prepare a workforce that reflects the diversity of society. By addressing these societal needs, advancing knowledge in cloud and network system administration contributes to creating a more equitable and inclusive educational environment, preparing a diverse and skilled workforce for the future.

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.

The demand for cloud infrastructure professionals is growing across in government and private sectors due to the increasing adoption of cloud technologies, making it promising career path for graduates. Graduates from the Network Technology, General Networking Area of Concentration program work in various sector industries such as Information Technology (IT) services, e-commerce, finance, and more. Graduates from this program support existing cloud infrastructure, implement cloud solutions, and provide technical support. Entry level positions include cloud network specialist, cloud system analyst and cloud policy advisor.

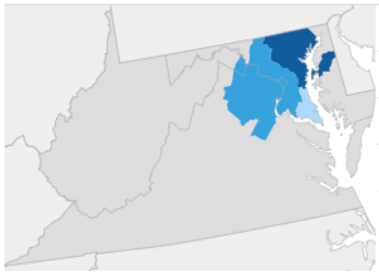
The following data is provided by Lightcast, Q1 2025 data set for Computer Network Support Specialists. There is a greater demand for specialists in cloud and network technology in Maryland, than nationwide. For the positions advertised in the Maryland region, between January 2025 and February 2025, 57% of advertisements listed no education, 24% listed a minimum High School or GED and 32% listed a minimum associate's degree. The types of position advertised included Desktop Support Technicians and Network Technicians.

Education Level | Minimum Education Level | Minimum Experience Level

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	21	57%
High school or GED	9	24%
Associate's degree	12	32%
Bachelor's degree	8	22%
Master's degree	0	0%
Ph.D. or professional degree	1	3%

Job Postings Regional Breakdown — Jump to Job Postings by Location



MSA	Unique Postings (Jan 2025 - Feb 2025)
Baltimore-Columbia-Towson, MD	26
Washington-Arlington-Alexandria, DC-VA-MD-WV	9
Lexington Park, MD	2

Sample Postings — Jump to Job Postings List

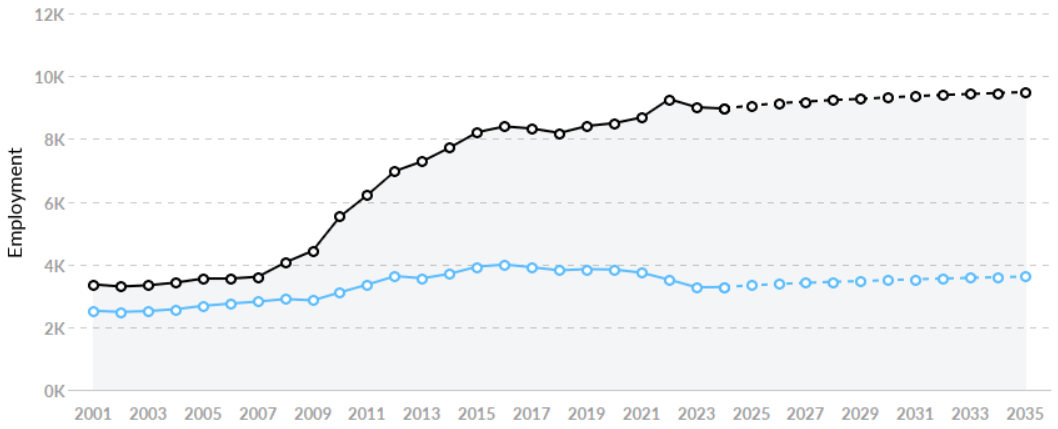
- Desktop Support Technicians — Lcg in Bethesda, MD (Feb 2025 - Active)
- NOC Technicians — Unclassified in Beltsville, MD (Feb 2025 - Active)
- Network Technicians — Amentum in Hanover, MD (Feb 2025 - Active)
- Network Technicians — Johns Hopkins in Baltimore, MD (Feb 2025 - Mar 2025)
- Service Consultants — CarMax in Laurel, MD (Feb 2025 - Mar 2025)

2. Present data and analysis projecting market demand and the availability of openings in a job market to be served by the new program.

The following data is provided by Lightcast, Q1 2025 data set for Computer Network Support Specialists. There is a greater demand for specialists in cloud and network technology in Maryland, than nationwide. In Maryland, employer demand for qualified candidates is estimated to grow by 2.8% by the end of 2030, with an estimated 9,321 jobs in State. The average salary for Computer Network Support Specialists is significantly higher in Maryland; $94,729 compared to $71,615 nationally.

Regional Employment Is Higher Than the National Average

An average area of this size typically has 3,330* jobs, while there are 9,064 here. This higher than average supply of jobs may make it easier for workers in this field to find employment in your area.

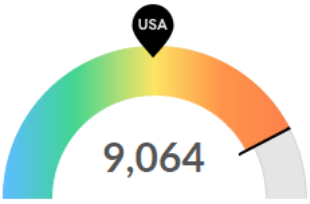


Region	2025 Jobs	2030 Jobs	Change	% Change
Maryland	9,064	9,321	257	2.8%
National Average	3,330	3,497	167	5.0%

Add Regions... Load a Group

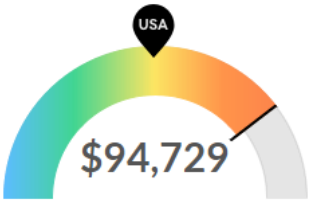
*National average values are derived by taking the national value for Computer Network Support Specialists and scaling it down to account for the difference in overall workforce size between the nation and Maryland. In other words, the values represent the national average adjusted for region size.

Aggressive Job Posting Demand Over a Deep Supply of Regional Jobs



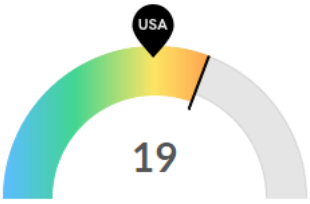
Jobs (2025)

Maryland is a hotspot for this kind of job. The national average for an area this size is 3,330* employees, while there are 9,064 here.



Compensation

Earnings are high in Maryland. The national median salary for Computer Network Support Specialists is $71,615, compared to $94,729 here.

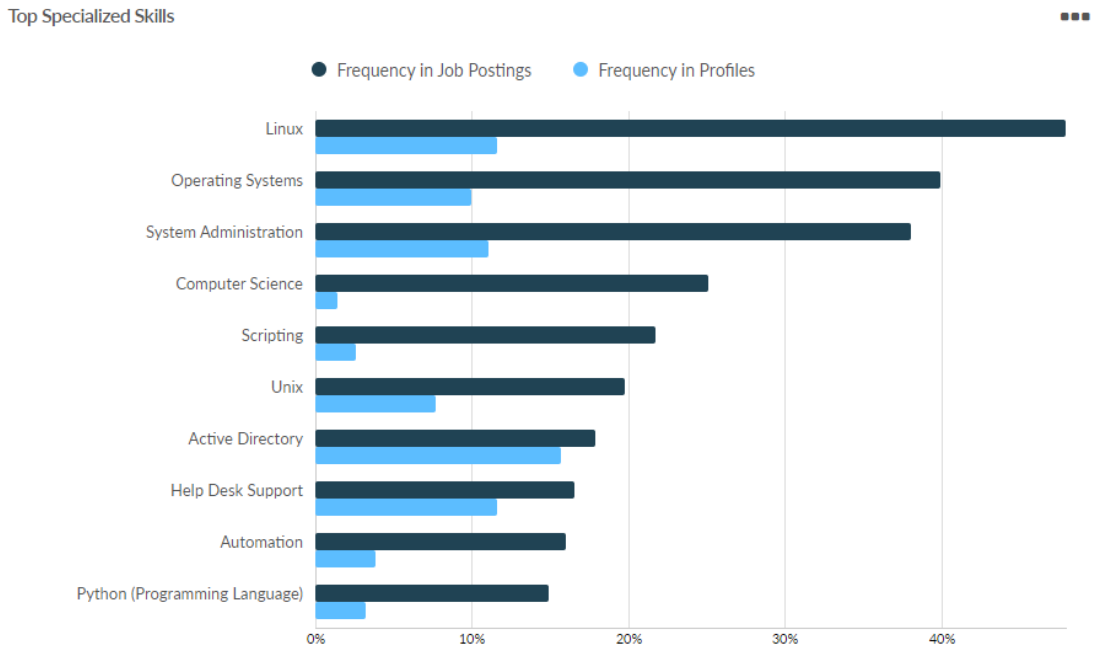


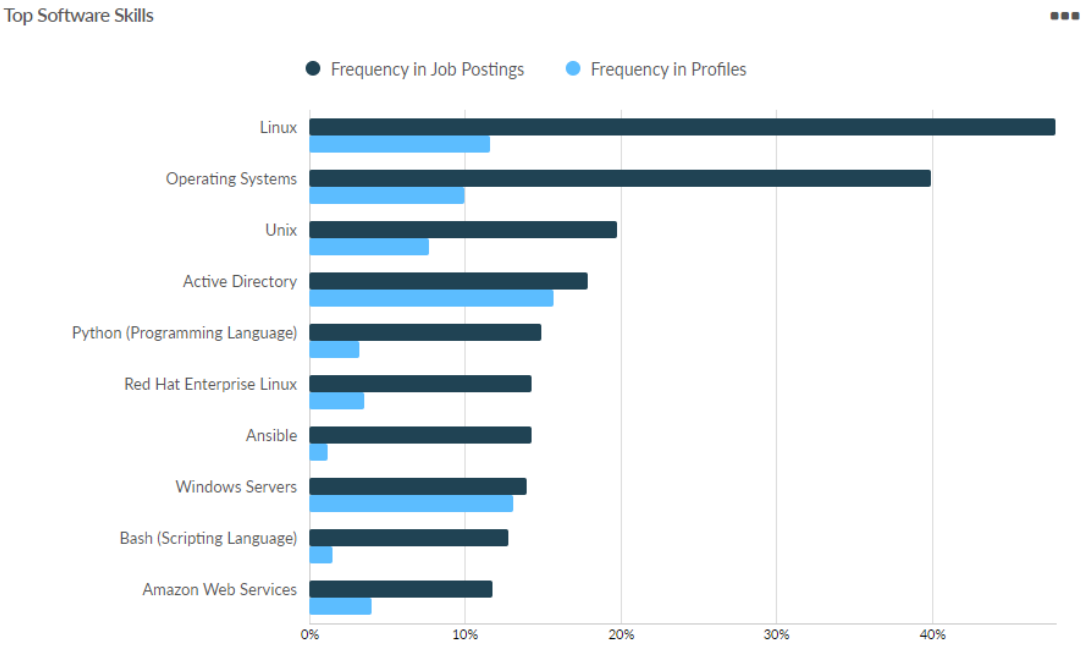
Job Posting Demand

Job posting activity is high in Maryland. The national average for an area this size is 13* job postings/mo, while there are 19 here.

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.**

The software and specialized skills currently identified by job adverts are reflective of some of the substantial changes summarized in this proposal. These include the addition of specialized coursework in AWS cloud certification, Linux+ certification.





4. **Provide data showing the current and projected supply of prospective graduates.**

Several community colleges graduate significant numbers of graduates in this field. CCBC is consolidating four existing areas of concentration in network technology, the current enrollment and completion numbers for which are summarized below. By concentrating existing and future students into the proposed stand-alone degree, CCBC plans to improve enrollment through more targeted and clearer student outreach. If approved, a two-year teach out plan will be adopted for any students currently enrolled in the four area of concentration, who wish to remain in these programs instead of changing into the new A.A.S.

Top Schools	Completions (2023)
University of Maryland Global Campus	1,918
University of Maryland-College Park	1,121
Johns Hopkins University	866
University of Maryland-Baltimore County	587
Towson University	497
Montgomery College	422
SANS Technology Institute	379
Anne Arundel Community College	374
Prince George's Community College	219
College of Southern Maryland	206

Program Name: Network Technology (all Areas of Concentration)					
	FY20	FY21	FY22	FY23	FY24
Enrollment	72	63	49	53	52
Completions	27	15	15	10	17

Proposed Program: A.A.S. in Network Technology, General Networking Area of Concentration					
	FY26	FY27	FY28	FY29	FY30
Enrollment	40	50	60	70	80

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.**

Although Network Technology associate degrees are present in virtually all community colleges in Maryland, only four community colleges currently have a stand-alone program focused on network technology and cloud computing, which are similar in curriculum to the program proposed here.

Keyword: Cloud
Degree: Associate Degree
Total: 4

Institution	Program	Degree
Anne Arundel Community College	CLOUD COMPUTING TRANSFER	Associate Degree
College of Southern Maryland	CLOUD AND INFORMATION TECHNOLOGY	Associate Degree
Montgomery College-All Campuses	CLOUD COMPUTING & NETWORK TECH	Associate Degree
Prince George's Community College	CLOUD TECHNOLOGIES	Associate Degree

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

There is a growing demand for cloud computing skills across various industries. Companies are increasingly adopting cloud services, leading to a significant need for trained professionals. Many regions face a skill gap in cloud technologies, and community colleges can help bridge this gap by providing relevant training. Community colleges offer more affordable education compared to four-year institution, making cloud technology training accessible to a broader population and often more accessible to local residents, providing opportunities for those who cannot relocate for education.

Cloud technology skills can lead to well-paying jobs and career advancement opportunities in IT, making it a valuable program for students seeking economic mobility. Cloud technology is a significant trend in IT, and offering such programs helps ensure that the educational offerings remain relevant and up-to-date with technological advancements.

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.**

This program is not anticipated to have any impact on the implementation or maintenance of high-demand programs at HBI's.

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.**

This program is not anticipated to have any potential impact on the uniqueness and institutional identities and missions of HBI's.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes (as outlined in COMAR13B.02.03.10):

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

New Program Proposals at CCBC are reviewed and approved according to the process developed through college governance, including approval by the Curriculum and Instruction Committee (CIC) and the full College Senate. In addition, this new degree proposal was carefully reviewed by the President and her Senior Staff prior to submission to the CCBC Board of Trustees for their endorsement. The President has affirmed that the program can be implemented within the existing institutional resources.

The program benefits from an advisory board that meets at least twice a year. The Advisory Board is comprised of faculty, student and alumni representatives, professionals in the field and workforce advocates.

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

The Network Technology, General Networking Area of Concentration program is designed to equip students with the comprehensive knowledge and practical skills necessary to manage, configure, and secure networked systems and cloud infrastructures. This program covers fundamental and advanced topics, including network protocols, system architecture, virtualization, cloud services, security, and troubleshooting. Students will gain hands-on experience with industry-standard tools and technologies, preparing them for a variety of roles in IT and cloud administration. The curriculum blends theoretical concepts with real-world applications, ensuring graduates are ready to meet the demands of modern IT environments. This program will prepare students for various industry certifications such as CompTIA A+, CompTIA Network+, Cisco Certified Network Associate (CCNA), Amazon Web Service (AWS) certification and VMWare Virtualization Certificate.

Upon successful completion of the Network Technology, General Networking Area of Concentration degree program, students will be able to:

1. Describe the basic concepts of networking, including OSI and TCP/IP models.
2. Configure and manage network devices and their functions such as routers and switches.
3. Install, configure, and maintain Windows and Linux operating systems.
4. Diagnose and resolve common network and system problems.
5. Understand the principles of virtualization and Cloud and their benefits.
6. Deploy and manage virtual machines using platforms such as VMware and Hyper-V.
7. Describe the architecture and components of cloud computing models (IaaS, PaaS, SaaS).
8. Configure and manage cloud services using platforms like AWS, Azure, and Google Cloud.
9. Implement configuration management tools such as Ansible, Puppet or Chef to deploy DevOps systems.
10. Discuss backup and disaster recovery procedure in the event of a failure.
11. Evaluate the latest developments in cloud computing and network administration.

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**

CCBC has a strong student learning outcomes assessment program that met all Middle States Commission on Higher Education (MSCHE) standards criteria in the College's most recent MSCHE decennial review. The course level assessment process utilizes externally validated assessments that directly measure student learning at course objective level. All assessment projects begin with the development of a Request for Proposal (RFP) and flow through the five stages as follows:

Stage 1: Designing and Proposing a Learning Outcomes Assessment Project

Stage 2: implementing the Design and Collecting and Analyzing the Data

Stage 3: Redesigning the Course to Improve Student Learning

Stage 4: Implementing Course revisions and Reassessing Student Learning

Stage 5: Final Analysis and Reporting Results

In addition, all general education courses undergo general education assessment that utilize common graded assignments (GCA's). Learning outcomes assessment in both discipline and general education courses provide a mechanism for continuous improvement.

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

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Program Electives	Any CSIT or DCOM course(s)	6	None		0
Total Program Electives		6	**Total Program Electives**		0
Program Total		**60**	**Program Total**		**60**

Program Coursework

DCOM 101 - Introduction to Data Communications: Explores an informational and theoretical foundation necessary for students to comprehend an overview of the concepts, theory, principles, and practices of data communications and computer networks. Students survey networking hardware including servers, switches, and routers. Students also investigate networking software including operating systems, protocols, and services, and network management, including server administration, virtualization, cloud computing, and security. The course is designed for a student pursuing a career in networking. Course offered every fall, spring and may be offered during additional sessions.

DCOM 130 – AWS Certified Cloud Practitioner: Provides the student with a comprehensive overview of Amazon Web Services (AWS) and cloud computing. Students will design, build, and manage a cloud network infrastructure. Topics include AWS technologies & services, cloud architecture & design, and implementation & support. This course helps students prepare for the AWS Certified Cloud Practitioner certification exam.

DCOM 162 – Foundations of Cloud Technology: Offers an introduction to the fundamentals of cloud computing, with a focus on cloud architecture, design principles, and the implementation and maintenance of cloud environments. Key topics include virtualization, cloud infrastructure, resource management, and disaster recovery. Students will engage in hands-on activities involving cloud management, deployment, and security across various cloud platforms. They will also learn provision, configuration, and management of cloud resources, with a focus on observability, scaling, and automation. Additionally, the course introduces core DevOps concepts related to cloud deployment. Upon completion, students will be prepared to take the CompTIA Cloud+ certification exam.

DCOM 163 – Computer Systems Management and Troubleshooting: Introduces computer hardware, software technologies, emphasizing the ability to install, configure, and troubleshoot PCs, mobile devices, and network hardware. Students will learn about various operating systems, including Windows, Linux, and macOS, and their built-in tools and utilities. Students also practice networking devices, implement security measures to protect devices and network, and best practices for operational procedures such as documentation and environmental safety. This course prepares the students to take CompTIA A+ certification.

DCOM 142 - Introduction to Linux/UNIX: Introduces fundamental concepts of various Linux distributions. Students practice common user tasks in the operating system (OS) shell. Students perform command line utilities, learn basics of shell scripting, pipes, redirection, Linux file system, and GNU Network Object Model Environment (GNOME). Graphical User Interface (GUI) and basic network commands are reviewed. Students learn to setup and manage users and groups and configure ownerships and permissions. Course offered every fall, spring and may be offered during additional sessions.

DCOM 202 - Windows Server: Students will install, configure, manage, maintain, and troubleshoot Microsoft Windows Server operating system. Topics include: Server administration, disk mirroring, Active Directory, NTFS permissions, global groups, remote management and performance monitoring. Course offered every fall, spring and may be offered during additional sessions. Prerequisite(s): DCOM 101.

DCOM 217 – CCNA I, Introduction to Networks: Provides an introduction to the architecture, structure, functions, components, and models of the internet and other computer networks. The principles and structures of Internet Protocol (IP) addressing, and the fundamentals of Ethernet concepts, media, and operations are introduced. Students build simple Local Area Networks (LANs) and perform basic configuration for routers and switches, which includes device hardening features and implementation of IP addressing schemes.

DCOM 218 – CCNA II, Switching, Outing and Wireless Essentials: Explores the architecture, components, and operations of routers and switches in a small network. Students configure a router and a switch for basic functionality and security. Students troubleshoot common issues with switches and routers that include both Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) networks including Virtual Local Area Networks (VLANs) and Wireless LANs (WLANs).

DCOM 219 – CCNA III, Enterprise Networking, Security and Automation: Addresses the architecture, components, and operations of routers and switches in larger and more complex networks. Students configure and troubleshoot routers to resolve common issues with Open Shortest Path First (OSPFv2) routing protocol. Students develop the knowledge and skills needed to implement network security by configuring a virtual private network (VPN) and access control lists (ACLs) on a router. Wide area networks (WAN) concepts including network design, virtualization, automation, and troubleshooting are reviewed. This course is the culminating course for the Cisco Certified Network Associate (CCNA) certification.

DCOM 251 - Local Area Networks: Explores planning, installing, configuring, administering, and troubleshooting a computer network through hands-on exercises and lecture materials that cover the fundamental building blocks that form a modern network. Topics include protocols, topologies, hardware, and network operating systems. This class is intended to serve the needs of students who are interested in understanding foundational, vendor-independent networking concepts, as well as those interested in taking the Computing Technology Industry Association’s (CompTIA) Network+ certification exam.

Course offered every fall, spring and may be offered during additional sessions. Prerequisite(s): DCOM 101 or permission of the Program Coordinator

DCOM 236 – DevOps Foundation and Implementation: Provides a comprehensive understanding of the principles, practices, and tools that form the backbone of contemporary DevOps. This course offers students and opportunity to apply continuous integration, continuous delivery, and continuous deployment. Core concepts of DevOps are covered, and students develop strategies to improve communication and collaboration between development and operations teams. Students get hands-on experience with DevOps tools and technologies.

DCOM 263 – Virtualization and Cloud Computing Using VMWare: Enables students to install, configure, manage, maintain, and troubleshoot a virtual network infrastructure/cloud platform using VMware VSphere. Students install and configure virtual machines, virtual networks, and virtual hard disks on datacenter and cloud servers. The course is designed for students pursuing a career in network engineering, virtualization, or cloud computing. The course is designed to help students prepare for the VMware certification exam.

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

General education requirements will be met in conjunction with program requirements that meet COMAR and CCBC policy. A semester-by- semester sequence will be provided accordingly in the college catalog.

1. **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, although students who complete the program are eligible to sit for some optional external credentials.

2. **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.**

CCBC provides clear, complete and accurate information regarding curriculum, course and degree requirements on the CCBC website as accessed through our online catalog: Community College of Baltimore County - Acalog ACMS™ (ccbcmd.edu). Faculty hold regularly scheduled office hours (face to face or online, per college policy). These office hours are available to students outside of class meeting times and are posted on the course syllabus. CCBC uses Quality Matters standards in online learning as a measure of online course design quality. These standards specifically require the following to be addressed within each course: minimum technical requirements for the course, minimum technology expectations, learning management system basic requirements and instructions, links and instructions for all student support services including disability support services, financial aid etc. The same information can be found on the CCBC Online website: CCBC Online (ccbcmd.edu). Course sections (face to face, blended and online) utilize a learning management system course shell and instructors are required, at a minimum, to post the course syllabus, progress grades and final grades online. Links to academic support services are available at: Resources for students (ccbcmd.edu). Information on financial aid and the cost of attending CCBC and its payment policies can be accessed here: Costs and Paying for College (ccbcmd.edu).

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.**

Recruitment and admissions materials are revised each year when the CCBC catalog is finalized. Accurate admissions information can be found at this site: Get Started (ccbcmd.edu). The college catalog is updated yearly and all program and course information is current. The college catalog can be accessed at this link: Community College of Baltimore County - Acalog ACMS™ (ccbcmd.edu).

H. Adequacy of Articulation (as outlined in COMAR 13B.02.03.19)

1. **If applicable, discuss how the program supports articulation with programs at partner institutions. Provide all relevant articulation agreements. More information for Articulation Agreements may be found here.**

As an Associate of Applied Sciences program, the primary purpose is career placement, although many of the courses that make up the program of study do transfer.

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 the proposed program.**

Faculty Member Name	Terminal Degree & Discipline	Full Time or Adjunct	Courses Taught
Sabum Anyangwe	M.A in Business Administration 1. Cisco Certified Instructor, CCNA	Full-Time	DCOM 101, DCOM 217, DCOM 218, DCOM 219 and DCOM 258
Vinitha Nithianandam	M.S in Solid State Electronics; 1. Cisco Certified Instructor, CCNA 2. CompTIA A+ Certification 3. Cisco Security Certification 4. Cellebrite Certified Operator Certification (Mobile Forensics) 5. Cellebrite Certified Physical Analyst Certification (Mobile Forensics) 6. Magnet Forensics Certification (Digital Forensics) 7. AccessData Forensics Certification	Full-Time	DCOM 142, DCOM 150, DCOM 217, DCOM 218, DCOM 219, DCOM 224 DCOM 250 and DCOM 265]
Dan Whitaker	Ed.D. Doctor of Education in PE 1. AWS Certified Cloud Practitioner Certification 2. VMware VCP certification	Full-Time	DCOM 101, DCOM 202, DCOM 141, DCOM 235, DCOM 258 and DCOM 263]
Eric Ward	Ph.D. CS	Full-Time	DCOM 101, DCOM 211, DCOM 212, DCOM 142, DCOM 215, DCOM 224 and DCOM 258]
New FT hire (TBD)		Full-Time	
Cody Mayfield	B.S in Cybersecurity	Full-Time	DCOM 101, DCOM 141, DCOM 235, DCOM 217]

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 Center for Excellence in Teaching and Learning (CETL) provides ongoing professional development opportunities for faculty and staff throughout the academic year. Additional professional development is

provided at yearly Fall Focus, Teaching and Learning Fair and Professional Development Day events. In addition, faculty are provided funding, on a regular basis, to present at regional and national conferences that relate to pedagogy and discipline areas of interest. CCBC recognizes that up-to-date pedagogy is essential in student success initiatives, as the college serves primarily in a teaching role.

CCBC expects that faculty teaching a fully online course will complete training called the "teaching Online Course". This is a five-week/twenty-hour online course that provides training on how to facilitate an established online course. The institution also requires faculty to complete an eighty-hour training in online course pedagogy and course design prior to the development of any new fully online course. Prerequisites for this training include Quality Matters training as well as Learning Management System (LMS) workshops through CETL and our LMS trainers. CCBC also has multiple online learning policies designed to foster best practices in online learning. These policies include, but are not limited to, a thirty percent (30%) authenticated assessment requirement, online office hours, and a consistent LMS menu template.

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.

Current library resources are sufficient and appropriate for the implementation of the proposed program. The college also subscribes to several online databases that would be helpful to students in this program. The CCBC Libraries' collection includes over 75,000 e-books and access to over 64,000 different journals and magazines. Students can access these resources anytime from any computer or mobile device on or off-campus.

Beyond the resources provided through CCBC, the CCBC Library has a reciprocal use and borrowing agreement with the University of Maryland Baltimore County, Albin O.Khun Library and the University of Baltimore, Robert L. Bigomolny Library that entitles CCBC students to on-site access and use of the facilities and resources of these libraries as well as the opportunity to check out books. The college also provides an InterLibrary Loan service: What is Interlibrary Loan (ILL) - Borrowing from other libraries (Inter Library Loan) - Research Guides at Community College of Baltimore County (ccbcmd.edu). In addition, to make library services more accessible to students, the CCBC Library provides a virtual chat reference service through the Library webpage: CCBC Libraries (ccbcmd.edu).

This new degree proposal was carefully reviewed by the President and her Senior Staff prior to submission to the CCBC Board of Trustees for their endorsement. The President has affirmed that the program can be implemented within existing institutional resources.

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.**

After careful review by Senior Staff and endorsement by CCBC's Board of Trustees, the President has affirmed that the program can be implemented within existing institutional resources. All courses that are part of this certificate are already being taught effectively by CCBC.

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

CCBC provides all students with a Microsoft Office e-mail address and has a single sign on SSO login process for all technologies. CCBC currently uses Brightspace as its Learning Management System. Help Desk support for all technology and distance education questions can be accessed both online and via a technical hotline: Technology Support at CCBC (ccbcmd.edu)

L. Adequacy of Financial Resources with Documentation (as outlined in COMAR13B.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.

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)	$104,910	$138,930	$173,040	$207,105	$241,260
a. Number of F/T Students	10	15	20	25	30
b. Annual Tuition/Fee Rate	$4,992	$4,992	$4,992	$4,992	$4,992
c. Total F/T Revenue (a x b)	$49,920	$74,880	$99,840	$124,800	$149,760
d. Number of P/T Students	30	35	40	45	50
e. Credit Hour rate	$122	$122	$122	$122	$122
f. Annual Credit Hour Rate	15	15	15	15	15

g. Total P/T Revenue (d x e x f)	$54,990	$64,050	$73,200	$82,350	$91,500
3. Grants, Contracts & Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1-4)	$104,910	$138,930	$173,040	$207,105	$241,260

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)	$364,000	$364,000	$377,000	$377,000	$390,000
a. Number of FTE	3.0 (1 FTE hire is currently underway)	3.0	3.0	3.0	3.0
b. Total Salary	$280,000	$280,000	$290,000	$290,000	$300,000
c. Total Benefits	$84,000	$84,000	$87,000	$87,000	$90,000
2. Admin. Staff (b + c below)	$35,100	$35,100	$39,000	$39,000	$39,000
a. Number of FTE	0.5	0.5	0.5	0.5	0.5
b. Total Salary	$27,000	$27,000	$30,000	$30,000	$30,000
c. Total Benefits	$8,100	$8,100	$9,000	$9,000	$9,000
3. Support Staff (b + c below)	$130,000	$130,000	$143,000	$143,000	$156,000
a. Number of FTE	0.5 lab tech and 1.0 cybersecurity engineer (hire in process)	0.5 lab tech and 1.0 cybersecurity engineer	0.5 lab tech and 1.0 cybersecurity engineer	0.5 lab tech and 1.0 cybersecurity engineer	0.5 lab tech and 1.0 cybersecurity engineer
b. Total Salary	$100,000	$100,000	$110,000	$110,000	$120,000
c. Total Benefits	$30,000	$30,000	$33,000	$33,000	$36,000
4. Technical Support and Equipment	$15,000	$15,000	$20,000	$20,000	$20,000
5. Library	0	0	0	0	0

6. New or Renovated Space	$10,000	$15,000	$15,000	$20,000	$20,000
7. Other Expenses	0	0	0	0	0
TOTAL (add 1-7)	$554,100	$559,100	$594,000	$599,000	$625,000

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.

Courses are evaluated using an online student evaluation tool (SmartEvals) on a regular basis. Using SmartEvals, students can evaluate both course design and the course's instructor. Faculty participate in annual evaluations by submitting an annual professional summary that highlights achievements in professional assignments, college and community service and professional growth activities.

CCBC has a strong student learning outcomes assessment program that met all Standard criteria in the College's most recent Middle States decennial review. This course level assessment process utilizes externally validated assessments that directly measure student learning at course objective level. All assessment projects begin with the development of a Request for Proposal (RFP) and flow through the five stages as follows:

Stage 1: Designing and Proposing a Learning Outcomes Assessment Project

Stage 2: implementing the Design and Collecting and Analyzing the Data

Stage 3: Redesigning the Course to Improve Student Learning

Stage 4: Implementing Course revisions and Reassessing Student Learning

Stage 5: Final Analysis and Reporting Results

Learning outcomes assessment provides a mechanism for continuous improvement.

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.

Full-time faculty prepare an Annual Professional Summary every year to document their achievements in the categories of professional assignments, college and community service and professional development. Supervisors use this information to prepare an annual evaluation of faculty performance. Students can also complete course evaluations on a regular basis. Courses are evaluated by anonymous comments and feedback offered by students through evaluation tools.

Assessment and documentation of student achievement will occur as part of CCBC's learning outcomes assessment and program review processes. Learning outcomes assessment occurs in discipline courses through a continuous improvement model outlined above. General education courses are assessed for general education outcomes every three years. Academic programs are reviewed on a five-year cycle.

Program review includes curriculum assessment as well as market feasibility analysis. As part of the program review, this A.A.S. degree will participate in program outcome assessment projects. Program coordinators must document how student learning outcomes were developed and validate how the outcomes relate to the college's mission.

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.**

CCBC is committed to ensuring equal opportunity and nondiscrimination in all practices. We are committed to equal treatment for all students and employees and will not discriminate based on race, color, religion, gender, age, national origin, ancestry, veteran status, disability, sexual orientation, or any other basis protected by law. CCBC is devoted to providing an environment where cultural diversity thrives. CCBC has a dedicated Intercultural Engagement team who offer a host of programs designed to enhance minority student success including guest speakers, study programs, clubs, and academic counseling.

To promote minority student success, one of the hallmarks of CCBC's strategic plan is the value of inclusiveness. That is, we honor the diversity of people, cultures, ideas, and viewpoints. To help faculty appreciate and to maximize the potential of a diverse student population in their classrooms, CCBC has a Culturally Responsive Teaching and Learning (CRTL) training program. The CRTL program is a multi-faceted initiative that engages faculty, staff, administrators, and students in the recursive process of self-reflection, dialogue, change and growth regarding cultural understanding and cooperation. This program has helped the college to close achievement gaps and thereby improve student success. It is noteworthy that CCBC received a Leah Meyer Austin Award at the Achieving the Dream conference in 2015, and the CRTL program was an important component to enable CCBC to improve student achievement and to meet equity goals.

Since its inception in 2004, the CRTL program has led 500+ faculty and staff, and thousands of students to actively address individual and collective self-awareness, attitudes and beliefs, knowledge of others and the skills needed to implement new understandings thought best practices of cultural competence.

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 is not a 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.

CCBC is approved to offer distance education per COMAR 13B.02.03.22 as the institution was previously approved to offer a distance education program prior to January 1, 2018 and is eligible to offer distance education throughout regional accreditor, the Middle States Commission on Higher Education (MSCHE). In addition, CCBC has been a member of the National Council for State Authorization Reciprocity Agreements (NC-SARA) since July 1, 2019.

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

CCBC's mission is to provide students with accessible, affordable and high-quality education. Its current strategic plan places an increased emphasis on online learning (distance education). Sustaining and growing online learning is interwoven into the academic schools' plans as well as the Department of Online Learning's (DOL) goals and objectives. The Instructional Technology budget supports technologies related to online learning. The DOL also has a budget, which provides resources for faculty training, technology as well as the promotion of a quality assurance process. CCBC has a dedicated, public facing webpage for online learning CCBC Online (ccbcmd.edu), which displays programs offered in an online format. It also provides both potential and current students with links to all services they might need.

Potential students are provided with a questionnaire to help determine if online learning is right for them. Students also have access to technical requirements for online coursework and online class policies which they may need to know prior to admission. Academic requirements for online programs do not differ from traditional face-to-face programs. Potential and current students have access to links to all relevant student services, such as disability support services, financial aid, etc. In addition, each online course clearly identifies links to these same services for students.

CCBC is a Quality Matters (QM) institution, and as such uses the QM rubric as its basis for design, faculty training and quality assurance of all online course offerings. Faculty, as subject matter experts, are the principal course developers, while the DOL oversees the overall process and schedule of online course creation. Additionally, DOL provides the faculty mandatory training for course facilitation and course development. Online course development incorporates sound online learning pedagogy to provide students with the most appropriate experiences in the discipline. Additionally, the DOL has its own internal website pages dedicated to providing faculty with policy, training, and best practice resources. CCBC has developed its own internal quality assurance process, now in its 5th year of reviews, using Quality Matters as its backbone. This process leverages the content knowledge as well as the course design knowledge of the faculty, providing a high quality, fiscally responsible manner to increase the quality of the college's online learning courses. Necessary online learning policies have been vetted and approved by the CCBC College Senate. DOL is responsible for implementation of those polices.

Additionally, shared governance is an integral part of the college's standard curriculum approval and review process for all courses, regardless of modality. Curricular expectations of online courses do not differ from those in the face-to-face format. CCBC faculty and staff understand the challenges that online learners face. Online course class sizes maximums are limited to 25. CCBC tracks success rates of online classes and compares that data to its face-to-face counterpart. CCBC uses Quality Matters standards, online faculty observations and student evaluations to monitor the effectiveness of the faculty member

and the course design. Online courses are also subject to the college's standard evaluations, with the Common Course Outline reviewed on a regular basis. The institution also assesses general education outcomes for all General Education (Core) coursework on a three-year cycle and course-level objectives are assessed through learning outcomes assessment projects. CCBC uses single-sign-on access for student email and college identification. The institution also has an authenticated assessment policy, to ensure integrity in the proctoring of major assessments. Faculty have access to the college's testing centers as well as a remote proctoring tool, vetted by faculty and staff, to ensure students have access to options for authenticated proctoring. CCBC's academic integrity policies and procedures are not just part of the college's catalog but are incorporated into each faculty member's course and CCBC's student portal (MyCCBC).