November 22, 2019

Dr. James D. Fielder
Secretary
Maryland Higher Education Commission
6 North Liberty Street
Baltimore, MD 21201

Dear Dr. Fielder:

Please accept this letter requesting the approval of the Associate of Arts in Computer Studies Transfer, Cybersecurity Concentration. This Area of Concentration has been recommended through the college curriculum committee and approved by the president and Board of Trustees.

Please contact me should you have any questions and/or need further information. A check has been mailed with a hard copy of the letter and coversheet; a full report has been sent electronically.

Thank you for your time and consideration.

Sincerely,

Kristin L. Mallory, Ed.D.
Vice President for Academic Affairs

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

Institution Submitting Proposal	Wor-Wic Community College

Each <u>action</u> 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	Payment Amount: $250	Date Submitted: 11/25/2019

Department Proposing Program	Technology
Degree Level and Degree Type	Associate of Arts
Title of Proposed Program	Computer Studies Transfer, Cybersecurity Concentration
Total Number of Credits	60
Suggested Codes	HEGIS: 498001.00 CIP: 11.1003
Program Modality	◉ On-campus ○ Distance Education (*fully online*)
Program Resources	◉ Using Existing Resources ○ Requiring New Resources
Projected Implementation Date	◉ Fall ○ Spring ○ Summer Year: 2020
Provide Link to Most Recent Academic Catalog	URL: **https://catalog.worwic.edu/**

Preferred Contact for this Proposal	Name:	Dr.Kristin L. Mallory
	Title:	Vice President for Academic Affairs
	Phone:	(410) 334-2813
	Email:	kmallory@worwic.edu

President/Chief Executive	Type Name: Dr. Murray K. Hoy
	Signature: Date: 11/25/19
	Date of Approval/Endorsement by Governing Board: 11/14/2019

Revised 3/2019

PROPOSAL FOR:

____ NEW INSTRUCTIONAL PROGRAM
_X_ EXPANSION/ MODIFICATION OF EXISTING PROGRAM
____ COOPERATIVE DEGREE PROGRAM
_X_ WITHIN EXISTING RESOURCES or ____ REQUIRING NEW RESOURCES

Wor-Wic Community College
Institution Submitting Proposal

Fall 2020
Projected Implementation Date

Computer Studies Transfer Degree , AA   **Cybersecurity Area of Concentration**
Award to be Offered   Title of Proposed Program

498001   **11.1003**
Suggested HEGIS Code   Suggested CIP Code

Technology   **Curtis Satterfield**
Department of Proposed Program   Name of Department Head

Dr. Kristin Mallory   **kmallory@worwic.edu**   **410-334-2913**
Contact Name   Contact E-Mail Address   Contact Phone Number

_____ 11/25/19   **President/Chief Executive Approval**
Signature and Date

November 14, 2019

_____ **Date Endorsed/Approved by Governing Board**
Date

1

A. Centrality to Institutional Mission Statement and Planning Priorities

A.1. Description of program:

This application is for the purpose of expanding the content of the current AA transfer degree in Computer Studies to include a concentration focused on Cybersecurity. Adding a concentration in Cybersecurity will allow students to start at Wor-Wic and transfer to a wide array of schools within Maryland, Delaware, Virginia, and Pennsylvania. While attending, Wor-Wic students will learn the basics of Cybersecurity including; scripting, programming, basic and advanced networking, and basic and advanced security. The student will also take relevant general education courses to prepare them for transferring to a four-year university.

The proposed program relates to the college's mission of "… providing affordable, high quality instruction for postsecondary credit programs and continuing education in a technology-driven environment." The Cybersecurity transfer concentration will allow students an affordable high-quality education in a highly technical discipline and supporting environment. Further, the offering of this program is unique to the area and will allow local students the opportunity to start at their local community college and then transfer to a four-year institution.

A.2. Support of strategic goals:

The proposed area of concentration directly supports the following strategic priorities for the college:

1. Provide service area residents with access to quality education and training at a reasonable cost.

   Currently, there are no local area colleges or universities offering a transfer degree associated with Cybersecurity. The institution constantly receives questions from prospective students about Cybersecurity programs. The proposed area of concentration will provide local area residents with access to a Cybersecurity option.

2. Offer courses and programs to prepare students for entry into the workforce, career advancement, licensure, certification, transfer to four-year colleges and universities, and personal development.

   The Cybersecurity concentration will allow students to transition from high school to a two-year school and prepare them for further education at a four-year school.

3. Partner with local high schools and universities to facilitate seamless transitions through multiple levels of education.

   Teachers and administrators at local high schools are excited about the proposed Cybersecurity program. If the program is approved they are looking forward to recommending the program to their students. Various aspects of computer study are the fastest growing occupational programs in secondary systems.

A.3. Funding for first five years

The institutional operational budget will supply the financial support for the Cybersecurity program instruction.

A.4. Institutional Commitment

Wor-Wic Community College is committed to the development and full implementation of the Cybersecurity program. The objectives of the Cybersecurity program support the college mission and goals. Wor-Wic outlines seven specific college goals. The Cybersecurity program College supports goals 2 and 7 as identified on the college website:

College goal 2: "Offer courses and programs to prepare students for entry into the workforce, career advancement, licensure, certification, transfer to four-year colleges and universities, and personal development." Students completing the Cybersecurity program have the ability to transfer to many different four-year colleges in Maryland and surrounding states.

College goal 7: "Acquire appropriate human, financial and technological resources to meet institutional needs." Through the institutional budgetary process, the college is dedicated to providing sufficient financial resources necessary to support the Cybersecurity program from conception to full implementation.

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

B.1

Global concerns of protecting consumer and proprietary business information are increasing exponentially as government entities and corporations race to keep up with technological advances and increasingly sophisticated hacking methodologies used to compromise security measures. Maryland has had its share of data breaches ("Maryland Security Breach Notices," 2019). Within the state, total incidents of data breaches were as follows:

2019 (738)
2018 (1067)
2017 (1084)
2016 (792)
2015 (482)

In relation to the Eastern Shore specifically, the statistics for businesses which dealt with the compromise of data included:

2019 (1)
2018 (2)
2016 (1)

While the numbers regarding breaches for the service area of Wor-Wic Community College may seem relatively low, the figures on statewide data breaches combined with the whole of data breaches within the United States is cause for both alarm and action.

Prevention is key in protecting sensitive information. As the numbers of Eastern Shore businesses continue to grow and as the reliance on technology increases, the consequence of a data breach brings with it the potential of liability issues, safety issues, and financial loss. Local and state governments are certainly not immune to the damage caused by hacking. In July of this year, the Maryland Department of Labor reported that as many as 78,000 clients may have been impacted by a data breach (Cohn, 2019). A hacking in May crippled Baltimore City Hall's entire computer network; this was a ransomware attack which had a far-reaching effect on residents in a multitude of ways (Donovan, 2019).

Because of Wor-Wic Community College's three county region on the southern region of Maryland's Eastern Shore, the college serves a large agricultural area, to include Perdue Farms headquarters, and Ocean City, Maryland. Ocean City is a nationally recognized Atlantic Ocean resort community with a population of 7,102 residents as of the last census; however, summer weekends can bring as many as 320,000 to 345,000 more people into the area. In addition, according to the Greater Ocean City Chamber of Commerce, in one year's time, as many as 8 million visitors come to the Ocean city area ("About Ocean City Maryland," 2019). Ocean City businesses and local government have been extending the tourist season beyond the summer by scheduling year-round events that have attracted customers within a 140-mile radius. The potential numbers of individuals that could be impacted by a data breach in this area alone is staggering.

Nationally, according to the FBI, the Internet Crime Complaint Center reported that in 2017 data breach losses totaled 1.4 billion dollars ("Latest Internet Crime Report Released," 2018). In order to support the technology needs of the diverse business base as well as government entities and protect consumer and business information, it is critical that computer support, information technology, computer network technicians and administrators are knowledgeable about computer telecommunication data security - a field commonly known as Cybersecurity.

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

C.1. 1. Employment opportunities

After completing the two-year Cybersecurity transfer degree, students can transfer to a four-year school to earn a bachelor's degree. Graduation with a four-year degree associated with Cybersecurity, will give students the option to work nearly anywhere in the country. Locally, there are hundreds of government and corporate facilities in Maryland, Virginia and DC that hire Cybersecurity professionals.

CSO states that Maryland has reported that there are "approximately 110,000 cyber-related engineering and data science jobs" in the state and that "of the 2018 Cybersecurity 500 list, 15 companies are based in Maryland" (Martin, 2019). The state is actively pursuing this industry sector as is evidenced by existing tax credits. Businesses which utilize security services from companies within the state can take advantage of the "Buy Maryland Cybersecurity Investment Incentive Tax Credit." Special programs related to funding have been set up to assist Cybersecurity companies, and there are specific

financial incentives for companies specializing in sensitive, government data security (Employer Security Clearances Costs Tax Credit) ("Cybersecurity Funding," 2019). Within Wor-Wic Community College's service area and the bordering counties of Dorchester County, MD, Sussex, DE and Accomack County, VA, there are an estimated 1,045 related jobs per EMSI Q4 2019 data. There are approximately 207 incumbent workers who are older than 55 years old and approaching retirement age ("Occupational Service Report," 2019).

Within Wor-Wic Community College's three county service area, each County Career and Technical High School offers computer and/or Information Technology courses which could provide pathway opportunities for high school graduates to continue their education at Wor-Wic Community College. Baccalaureate degrees related to Cybersecurity are offered at Salisbury University and the University of Maryland Eastern Shore Campus and have the potential to provide pathway opportunities for Wor-Wic Community College graduates. Currently there are two community colleges offering Cybersecurity programs in the Delmarva Peninsula: Chesapeake College located 60 miles away and serving five Maryland counties on the northwest region of the peninsula and Delaware Technical College serving the state of Delaware.

The benefits of this program for Wor-Wic Community College students would be tremendous, and, in keeping with Wor-Wic Community College's commitment to innovative programs that enhance the quality of life within the service area, it is clear that this program would be invaluable for both employment purposes and in contributing to the safety and security of businesses, government entities, and residents. Additionally, it would further enhance Wor-Wic Community College's reputation for offering relevant, cutting-edge programs that meet the needs of the college's tri-county service region.

C.2. Data analysis projecting market demand

Information security professionals can expect job growth rates of 32% through 2028 ("Information Security Analysts", 2018). This field is diverse and offers opportunities for individuals holding associate's degrees and further opportunities for students who go on to complete their baccalaureate degree. As one expert states, a degree provides the "foundation" for a successful career in this sector (Torpey, 2018). Major corporations offer the potential of employment opportunities for students holding associate degrees for jobs such as Associate Cybersecurity Operations Center Analyst, Cybersecurity Risk Monitors, Cybersecurity Staff, Cyber Threat Intelligence Analyst, Data Engineer, and numerous other specialty fields.

C.3. Educational and training needs over the next 5 years

CSO states that Maryland has reported that there are "approximately 110,000 cyber-related engineering and data science jobs" in the state and that "of the 2018 Cybersecurity 500 list, 15 companies are based in Maryland" (Martin, 2019). The state is actively pursuing this industry sector as is evidenced by existing tax credits. Businesses which utilize security services from companies within the state can take advantage of the "Buy Maryland Cybersecurity Investment Incentive Tax Credit." Special programs related to funding have been set up to assist Cybersecurity companies, and there are specific

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C.4. Current and Projected supply of prospective graduates

Currently, there are no Cybersecurity graduates in the local area as the program does not exist at any local area college. After implementation of the new concentration there will be approximately 15-20 graduates per year that are prepared to transfer to a four-year institution and complete a higher-level degree.

D. Reasonableness of Program Duplication

D.1. Similar programs in state or surrounding area:

There are no comparable programs in the college coverage area or in the larger regional area of the Delmarva Peninsula.

The following schools have a Cybersecurity track within a bachelor's degree:
- Towson University (Cyber Operations Track in Computer Science)
- Frostburg State University (Secure Computing and Information Assurance)
- Bowie State University (Cyber Security Specialization)
- Morgan State University (BSEE with Cyber Security Track)

The following schools have an accelerated Bachelors and Master's program in Cybersecurity:
- University of Maryland Baltimore County (All Cybersecurity classes are masters level) (The UMBC program is geared towards advanced programming at the bachelors level and introductory concepts of Cybersecurity at the graduate level.)

The following schools have a graduate program in Cybersecurity:
- University of Maryland Baltimore County
- University of Maryland
- University of Maryland Eastern Shore

The following schools have a graduate certificate in Cybersecurity:
- University of Maryland Baltimore County

D.2. Justification for Proposed Program

There is an extreme shortage of Cybersecurity professionals with the highest IT role in demand being the Cybersecurity Engineer. The Cybersecurity market growth continues this year with a forecast of $124 Million in spending vs $114 Million in 2018 and growth is expected to continue at 12-15% year-over-year growth through 2021. Median entry

level positions start at $60k/year with the mid 80% range between $42k and $80k/year. The government budget for Cybersecurity is $15 Billion, a 4.1% increase from 2018 and by far the largest of any organizational entity in the US.

After graduation with a four-year degree associated with Cybersecurity, students have the option to work nearly anywhere in the country. Locally, there are hundreds of government and corporate facilities in Maryland, Virginia and DC that hire Cybersecurity professionals including: Carahsoft Tech Corp, Iron Bow Technologies, ThunderCat Technology, Telos Corp, TISTA Science & Tech Corp, Tenable Network Security, Alarm.com, Cyren, LookingGlass Cyber, Endgame, Savi Technology, AppGuard,m Sonatype, Fugue, Mandiant, KeyW Corp, CyberCore Technologies, Tenable, Vision Technologies Inc, and ZeroFOX.

E. Relevance to High Demand Programs at Historically Black Institutions

Morgan State University and University of Maryland Eastern Shore are the only Historically Black Institutions in Maryland to offer Cybersecurity degrees. Students from Wor-Wic will have the ability to transfer to Morgan State and UMES to complete a four-year degree.

F. Relevance to the Identity of Historically Black Institutions

Once the program has been approved Wor-Wic will seek to make articulation agreements with Morgan State and UMES to allow students to transfer.

G. Adequacy of Curriculum Design and Delivery to Related Learning Outcomes

G.1. Describe how the program was established and the faculty who will oversee the program.

The Cybersecurity program was established by examining four-year schools with Cybersecurity degrees and establishing a two-year program that will allow students to start at Wor-Wic and transfer to a four-year college to complete a bachelor's degree in Cybersecurity. Kevin Justice, Instructor of Computer Studies and Curtis Satterfield, Technology Department Head and Associate Professor of Computer Studies will oversee the program.

G.2. Educational Objectives and Student Learning Outcomes:

Graduates of the Cybersecurity concentration will be able to:

1. Identify and describe Cybersecurity threats as they relate to confidentiality, integrity, and availability;

2. Identify and analyze security risks to determine potential impacts to people, processes and systems;

3. Assess a system's security vulnerabilities using appropriate resources and apply software patches to operating systems and applications; and

4. Develop plans to mitigate security risks.

Student Learning Outcomes:

1. Students will be able to create a Cybersecurity policy while considering implications of business, productivity, and accessibility.

2. Students will be able to articulate Cybersecurity principles in written and oral communications to their classmates and the instructor.

3. Students will be able to utilize a variety of sources to research, analyze, and obtain software to scan for security threats and risks.

4. Students will be able to analyze and interpret output from security and threat analysis software and tests and recommend appropriate courses of remedy.

G.3. Assessment

a. Student Learning Outcomes

The college requires continual assessment of programs, courses, and faculty as set forth by their policies and procedures. Benchmarks are set on a program and course level basis. Courses are evaluated yearly to identify any learning objectives that are not being met. The standard benchmark for the school is 70% pass rate by objective on final exams. If a course is identified as failing to meet this benchmark on one or more objectives, appropriate corrective action is taken by the course coordinators and department heads. Action plans are created and updated at the six-month and one-year marks to ensure the benchmarks have improved. This serves as both assessment of a course and student learning outcomes for the course.

Faculty participate in a yearly evaluation process to address any issues at both the personnel level and the teaching level. Faculty must submit both a plan of instruction, writing assignment, and personal narrative explaining their accomplishments over the prior year. Student opinion of learning survey data is incorporated into the faculty's evaluation. The scores are presented to the faculty department heads who send recommendations of contract renewal to the appropriate dean.

b. Program Learning Outcomes

As part of the institution's assessment plan, all courses and programs have an annual review to ensure that educational objectives and student learning outcomes are being met. The department head writes an end-of-year report that explains the assessment measures, outcomes, and any action plans that have been created in the event that courses are not meeting benchmarks. In addition, the college has a five-year program review cycle that examines the progress of the program over the previous five years. These annual and five-year evaluations are used to identify progress of the program and ensure that any issues are addressed via action plans and quarterly updates.

G.4. Course list including title, credit hours, and course descriptions:

Computer Studies Transfer
Associate of Applied Science Degree
Cybersecurity Concentration

Summer II	First Year	Credit Hours
SDV 100	Fundamentals of College Study	<u>1</u>
		1

Fall		
CMP 134	Approaches to Problem Solving	4
CMP 108	Cybersecurity Ethics	1
CMP 115	Fundamentals of Computer Architecture	4
*ENG 101	Fundamentals of English I	3
*MTH 121	Pre-calculus I	<u>3</u>
		15

Spring		
CMP 135	Introduction to Programming	4
*CMP 150	Introduction to Networking	4
*ENG 151	Fundamentals of English II	3
MTH 122	Pre-calculus II	<u>4</u>
		15

	Second Year	
Fall		
*CMP 225	Data Communications and Networking	4
*CMP 245	Computer and Network Security	4
GEN ED	Biological/Physical Science Requirement	4
GEN ED	Social/Behavioral Science Requirement	<u>3</u>
		15

Spring		
*CMP 248	Application of Cybersecurity	4
GEN ED	Arts & Humanities	3
GEN ED	Biological/Physical Science Requirement	4
GEN ED	Social/Behavioral Science Requirement	<u>3</u>
		14

* Prerequisite
required   Total: 60

Computer Courses:

CMP 108 – Cybersecurity Ethics

This course examines the ethical aspects of Cybersecurity. Students are introduced to methodologies, principles, values, and frameworks to facilitate the study of ethics. Topics include ethical review and discussion of relevant laws, regulations, policies, standards, psychology and hacker culture. Lecture Hours: 13. This course is usually offered in the fall and spring semesters.

CMP 115 – Fundamentals of Computer Architecture

This course covers the basic organization and design of computers. Topics include the organization and function of central processing units (CPUs), memory, bus structures, input/output devices, operating systems, application software and networks. Lecture Hours: 39. Laboratory Hours: 26. Laboratory Fee: $25. Usually offered in the fall and spring semesters.

CMP 134 – Approaches to Problem Solving – 4 Credits

This course provides students with a firm foundation in problem-solving approaches in computer programming while facilitating the development of good structured programming skills for solving typical programming problems and applying them to real world problems. Students will define and analyze problems, design computer solution algorithms and prove the correctness of the solution. Lecture Hours: 26. Laboratory Hours: 26. Laboratory Fee: $15. This course is usually offered in the fall and spring semesters.

CMP 135 – Introduction to Programming – 4 Credits

This course introduces students to the basic principles of programming, object-oriented concepts, and terminology. Using an industry-appropriate and current programming language, students are introduced to the concepts of decision, repetition, objects, classes, inheritance and polymorphism. Prerequisite CMP-102 or MTH-099 with grade of "C" or better or permission of the department head.

CMP 150 – Introduction to Networking – 4 Credits

This course provides a background to networks and how they are used. This course covers how local area networks (LANs) are managed, the types of LANs available today and the software that LANs use. Students are also introduced to the concepts of wide area networks. Lecture Hours: 39. Laboratory Hours: 26. Laboratory Fee: $25. Prerequisite(s): CMP 115 or permission of the department head. Usually offered in the spring semester.

CMP 225 – Data Communications and Networking

This course covers the operations of computer networks and network operating systems. Documentation and network best practices are emphasized. This course provides students with hands-on experience in accessing computer networks. Lecture Hours: 26.

Laboratory Hours: 52. Laboratory Fee: $25. Prerequisite(s): CMP 150 or permission of the department head. Usually offered in the fall semester.

CMP 245 – Computer and Network Security – 4 Credits

This course covers the principles of computer system security, with a focus on network security. Topics include network attacks and defenses, application security (e.g., web, email and databases), viruses, social engineering attacks, privacy, digital rights management, authentication methods, access control, cryptography, public key infrastructure, identifying attacks and vulnerabilities, and wireless network security. Students also learn about security procedures to protect data in computer environments, the effects of viruses and ethical issues raised by computer security in the business world. Lecture Hours: 26. Laboratory Hours: 26. Laboratory Fee: $25. Prerequisite(s): CMP 150 or permission of the department head. Usually offered in the fall semester.

CMP 248 – Application of Cybersecurity – 4 Credits

This course emphasizes best practices in Cybersecurity by providing an understanding of major concepts in Cybersecurity, computer forensics and cyber intelligence. Students gain practical knowledge of malware analysis, cyber operations and electronic crime through research and labs. Lecture Hours: 26. Laboratory Hours: 52. Laboratory Fee: $25. Prerequisite: CMP 225 and CMP 245. This course is usually offered in the spring semester.

General Education Courses:

SDV-100 – Fundamentals of College Study I – Credit

This course is designed to introduce students to the information and habits that facilitate academic success at the college level. The course presents modules focusing on the expectations and realities of college responsibility; active learning and critical thinking skills; increasing motivation and decreasing stress; analyzing the syllabus, instructor and course; establishing a learning style; organizing and balancing family, work and school; improving study and note-taking skills, and test-taking strategies; advisement, registration and the college catalog; safety, student services and other administrative resources; rules, regulations and civility; and lifelong learning. Students who do not pass this course must take it again the following fall or spring term. Lecture Hours: 15. Usually offered in the fall, spring and summer semesters.

ENG 101 – Fundamentals of English I – 3 Credits (English requirement)

This course is designed to help students develop their college-level writing skills with an emphasis on the writing process. This course includes an introduction to research skills. Students write summary assignments and a series of essays in various modes, culminating in an argumentative research paper. Students must earn a grade of "C" or better in this course in order to enroll in ENG 151. Lecture Hours: 39. Prerequisites: ENG 095 and ENG 096, or ENG 097, with grades of "C" or better, or acceptable reading and writing placement test scores. Usually offered in the fall, spring and summer semesters.

ENG 151 – Fundamentals of English II - 3 Credits (English requirement)

This course continues to help students develop their college-level writing skills. Students are introduced to the study of literature (prose, poetry, fiction and drama). Students integrate outside sources with their own ideas in written arguments. They also refine their research and documentation skills. Lecture Hours: 39. Prerequisite: ENG 101 with a grade of "C" or better. Usually offered in the fall, spring and summer semesters.

MTH 121 – Precalculus I

This course covers the advanced algebra necessary to prepare students for the study of calculus. Topics include solving, graphing and modeling with linear, quadratic, polynomial, rational, radical, exponential, logarithmic equations and inequalities. Basic conic sections, matrices and linear programming topics are also included. Lecture Hours: 39. Prerequisite(s): MTH 099 with a grade of "C" or better or an acceptable mathematics placement test score. Usually offered in the fall and spring semesters.

MTH 122 – Precalculus II

This course is a continuation of MTH 121. Trigonometry and advanced algebra are studied to prepare students for calculus. Trigonometric topics include angle measurement, definitions of the six trigonometric functions from the right triangle and unit circle perspectives, graphs, identities, inverses and equations. Algebraic topics include polar coordinates, parametric equations and a review of functions and graphs. A problem-solving approach utilizes applications and a graphing calculator throughout the course. Lecture Hours: 52. Prerequisite(s): MTH 121 with a grade of "C" or better or an acceptable mathematics placement test score. Usually offered in the fall and spring semesters.

GEN ED – Behavioral Social Science requirement – 6 Credits

Choose from ECO 151 – Principles of Macroeconomics, ECO 201 – Principles of Microeconomics, GEO 102 – Human Geography, POL 101 – American Government, PSY 101 – Intro to Psychology, PSY 201 – Human Relations, or SOC 101 – Introduction to Sociology

GEN ED – Arts and Humanities requirement – 3 Credits

Choose from FRN 101 – Fundamentals of French I, FRN 102 - Fundamentals of French II, HUM 101 – Introduction to the Arts, MUS 101 – Music Appreciation, PHL 101 – Philosophy 101, SPN 101 – Fundamentals of Spanish I, or SPN 102 - Fundamentals of Spanish II.

GEN ED – Biological/Physical Science Requirement – 8 Credits

Choose From: BIO 101 – Fundamentals of Biology, CHM 101 – General Chemistry I, ENV 101 – Environmental Science, GEO 101 – Earth and Space Science, or PHY 104 – Physical Science

G.5. General Education requirements:

For an associate of arts (AA) degree, 28 hours of general education credits are required. The program will meet these requirements through a variety of specific course requirements as well as electives within multiple disciplines. The total of general education credits in the Cybersecurity concentration equals 31 credits, 3 credits above the 28-credit minimum for an associate of arts degree. Listed in section G.4. above, are all general education courses to satisfy the degree requirements.

G.6. Specialized Accreditation

There are no specialized accreditation or graduate certificate requirements for this program.

G.7. Contracts with other Institutions

N/A

G.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 programs and requirements for program completion at Wor-Wic are explained and outlined in the college's catalog. Each degree or certificate has a clear outline of the courses required to complete the degree. In addition, all courses have description in the catalog that explains the course, the semesters (fall, spring, or summer) when the course is offered, fees, and any prerequisites. The catalog is accessible through the college's website and both current and prospective students can view the requirements for any degree. Further, current students have access to an online portal that shows what courses they have taken and what courses they still need to take in order to complete their degree. The college also requires all students to take SDV 100 Introduction to College Study. This course covers topics such as meeting with your faculty advisor, how to plan courses on the student's schedule, necessary skills for taking online courses, overview of the Blackboard LMS, and the help that Student Services can provide to students. When the student registers for classes, they apply on the website which outlines the process and also explains the opportunity to apply for financial aid. When a student registers for courses, they are informed about the cost and payment policies.

H. Adequacy of Articulation

Wor-Wic currently has articulation agreements with all secondary school systems in its coverage area as well as others where there are no applicable state programs available. These agreements are reviewed, improved, and updated on an annual basis through a meeting hosted by the college. The meeting is attended by Wor-Wic department chairs and faculty as well as secondary instructors who are involved in related classes. From this meeting, articulated class lists are approved by the necessary executives and re-published annually for secondary system, student, parent, faculty and advisor use.

For articulations at the baccalaureate level following approval of this concentration, Wor-Wic will pursue articulations with appropriate institutions, particularly where we have established relationships related to other programs. These include UMBC, Morgan State and Wilmington University as identified in section D.1 above.

I. Adequacy of Faculty Resources

I.1 Faculty Summary

Current computer studies programs comprise a transfer degree and an occupational degree with two concentrations as well as two additional certificates. Dedicated faculty resources consist of three full-time faculty with any part-time faculty contracted as needed. The current faculty consists of; Curtis Satterfield Technology Department Head and associate professor of computer studies, Mike Kelley assistant professor of computer studies, and Kevin Justice, instructor of computer studies. The following table shows faculty rank, terminal degree, and courses that they will teach in the new program.

Faculty Member	Faculty Rank	Terminal Degree	Full or Part-time	Courses Taught
Curtis Satterfield	Associate Professor	Ph.D.	Full-time	CMP 225 Data Communications and Networking (4)
Kevin Justice	Instructor	B.S.	Full-time	CMP 108 Cybersecurity Ethics (1) CMP 115 Fundamentals of Computer Architecture (4) CMP 150 Introduction to Networking (4) CMP 245 Computer and Network Security (4) CMP 248 Application of Cybersecurity (4)
Michael Kelley	Assistant Professor	B.S.	Full-time	CMP 134 Approaches to Problem Solving (4) CMP 135 Intro to Programming (4)

The current staffing levels are considered sufficient to support the requested addition of the new concentration. No additional faculty resources are anticipated for this program.

I.2. Ongoing pedagogy training for faculty

a. Pedagogy that meets the needs of the students

Each year the college has an annual professional development day for faculty that includes training on pedagogical effectiveness. Training is also offered in dealing with special needs students and teaching to diverse student populations.

b. The learning management system

The college requires that all instructors use Blackboard's grade book for their classes and all faculty are required to complete first level training for Blackboard. For online instructors, two higher levels of training are required to be certified to teach an online or hybrid course. The college provides several LMS training sessions each year to support the faculty.

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

The college follows the Quality Matters method of evaluating and assessing online courses. Each year the department head is required to assess each online course in their department and then those courses are peer-reviewed as well. Training for the LMS is offered year-round for faculty and department heads.

J. Adequacy of Library Resources

Students in the Cybersecurity concentration will have ready access to a supply of current and relevant books, journals, periodicals, computers, software, and other reference materials needed to meet the requirements of the curriculum. The program budget allocates funding for specific reference materials. Wor-Wic uses an electronic library that supports the academic needs of constituents. Multiple media centers are staffed to provide research assistance. Web-delivered subscription databases cover academic disciplines, including computer studies. Wor-Wic students also have privileges for the libraries at University of Maryland Eastern Shore and Salisbury University.

K. Adequacy of Physical Resources, Infrastructure and Instructional Equipment

K.1. Physical facilities, infrastructure, and instructional equipment

The computer studies department facilitates two labs with four separate, physical areas: a fully racked and secured server room; two separate classrooms equipped with high-end desktop computers; and a "work bench" laboratory space allowing physical work to done on computers and related equipment. The network capability is fully functional both internally to the classroom and college resources, as well as suitably isolated to allow system/security work to be done without putting college-wide resources at risk. All equipment is of high quality. Current technologies are fully implemented and sufficient. Each full-time instructor for the program has their own office. The current infrastructure and equipment, as described, are more than adequate to support the proposed concentration in Cybersecurity. Please see the attached statement of support from the college president.

K.2. Distance Education Assurances

The college provides every student with a free email account on the worwic.edu domain. The college also utilizes the Blackboard Learning Management system and is fully supported by IT staff and an instructional technologist. All students who enroll in distance education courses are required to take a mandatory Blackboard tutorial with assessment before gaining access to online course materials.

L. Adequacy of Financial Resources.

L.1. Table 1 – Resources and Narrative Rationale

Table 1 explains the financial resources for the Cybersecurity program. The budget allocations reflect an initial enrollment of 20 students in the program. Since the Cybersecurity program will be the first of its kind introduced on the Eastern Shore of Maryland, Delaware, and Virginia, the college anticipates an initial enrollment of approximately 20 students with an increase of 2-3 students per year as demonstrated in the table below. The identified credit hour rate estimates an approximate 3% increase during the projected five-year budget plan.

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)	53200	54416	55328	56240	57152
a. Number of F/T students	20	22	25	27	30
b. Annual tuition/fee rate	3325	3401	3458	3515	3572
c. Total F/T revenue (a * b)	66500	74822	86450	94905	107160
d. Number of P/T students	0	0	0	0	0
e. Credit hour rate	116	120	123	126	129
f. Annual credit hour	19	19	19	19	19
g. Total P/T revenue (d * e * f)	0	0	0	0	0
3. Grants, Contracts & other external sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1 - 4)	66500	74822	86450	94905	107160

L.2. Table 2 – Program Expenditures and Narrative Rationale

Table 2 demonstrates the Cybersecurity program expenditures. The three current full-time faculty will be teaching the courses and no new faculty will be necessary. Additionally, the expenditures chart explains a negligible equipment expense. Equipment expenses are minimal due to the lifecycle of equipment used in the computer studies programs. The college will not accrue any significant expenses because new equipment purchase is not required for this program.

TABLE 2: EXPENDITURES					
Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (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
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	1000	1000	1000	1000	1000
5. Library	0	0	0	0	0
6. New or renovated space	0	0	0	0	0
7. Other expenses	0	0	0	0	0
TOTAL (Add 1 - 7)	1000	1000	1000	1000	1000

Since this application covers the expansion of the current transfer degree program to include a Cybersecurity area of concentration, the college and program are sufficiently resourced to support this addition. The related computer programs that are currently offered are supported by the college's annual operational funding. No additional financial resources are required beyond current levels to implement this proposal.

M. Adequacy of provisions for evaluation of program

M.1. Evaluation Procedures – Courses, Faculty, Student Learning Outcomes

The college requires continual assessment of programs, courses, and faculty as set forth by their policies and procedures. Benchmarks are set on a program and course level basis. Courses are evaluated yearly to identify any learning objectives that are not being met. The standard benchmark for the school is 70% pass rate by objective on final exams. If a course is identified as failing to meet this benchmark on one or more objectives, appropriate corrective action is taken by the course coordinators and department heads. Action plans are created and updated at the six-month and one-year marks to ensure the benchmarks have improved. This serves as both assessment of a course and student learning outcomes for the course.

Faculty participate in a yearly evaluation process to address any issues at both the personnel level and the teaching level. Faculty must submit both a plan of instruction, writing assignment, and personal narrative explaining their accomplishments over the prior year. Student opinion of learning survey data is incorporated into the faculty's evaluation. The scores are presented to the faculty department heads who send recommendations of contract renewal to the appropriate dean.

M.2. Evaluation of Proposed Program's Effectiveness

As part of the institution's assessment plan, all courses and programs have an annual review to ensure that educational objectives and student learning outcomes are being met. The department head writes and end-of-year report that explains the assessment measures, outcomes, and any action plans that have been created in the event that courses are not meeting benchmarks. In addition, the college has a five-year program review cycle that examines the progress of the program over the previous five years. These annual and five-year evaluations are used to identify progress of the program and ensure that any issues are addressed via action plans and quarterly updates.

N. Consistency with the State's Minority Student Achievement Goals

Wor-Wic Community College maintains a cultural diversity plan, which states:

"Wor-Wic Community College is committed to a plan of cultural diversity that promotes inclusivity of diverse students and employees. The college has created a welcoming atmosphere on campus and has infused cultural diversity in all college programs, services and communications. The college has demonstrated this commitment to cultural diversity through the vision, values, mission, and goals stated in the strategic plan. The strategic plan of the college is in alignment with the diversity goals of the Maryland State Plan for Higher Education, including implementation strategies and timelines for meeting the goals. The college adheres to the definition of cultural diversity as *inclusion of those racial and ethnic groups and individuals that are or have been underrepresented in higher education* [Education Article, Annotated Code of Maryland 11-406-(b) (1) (iii)]."

This plan identifies how cultural diversity and minority achievement is addressed in each of the vision, mission and values' statements as well as long-term goals and strategic initiatives.

Additionally, each year Wor-Wic produces a cultural diversity report in compliance with the Maryland Higher Education Commission reporting requirements for college cultural diversity plans [Education Article, Annotated Code of Maryland 11-406-(b) (1) (iii)]. The report describes the set of initiatives and achievements accomplished in support of the diversity plan for each year.

O. Relationship of Low Productivity Programs

N/A

P. Adequacy of Distance Education Programs

Courses for this program will be offered through both distance education and face-to-face. While not currently a member of C-RAC, the College complies with each of the guidelines through appropriate policies and practices. Middle States Commission on Higher Education and MHEC has approved Wor-Wic Community College to offer distance education programs.

MEMORANDUM

TO: Maryland Higher Education Commission

FROM: Dr. Murray K. Hoy, President

DATE: November 21, 2019

RE: New Area of Concentration

Per the Maryland Higher Education Commission application process for program approval, I am writing to express my support for the creation of the Cybersecurity Concentration for the Computer Studies Transfer A.A. degree program at Wor-Wic Community College.

With the three faculty in the computer studies area, the existing laboratories, and the dedication of an existing space for computer courses, the college is well positioned to initiate the new area of concentration beginning fall 2020, within existing institutional resources.