ACADEMIC AFFAIRS
STEVENSON
UNIVERSITY
Executive Vice President

1525 Greenspring Valley Road
Stevenson, Maryland 21153

15 February 2018

James D. Fielder, Jr., Ph.D.
Secretary of Higher Education
Maryland Higher Education Commission
6 N. Liberty Street, 10th Floor
Baltimore, Maryland 21201

Dear Dr. Fielder:

On behalf of President Elliot Hirshman and Stevenson University, I am pleased to submit the enclosed proposal to add a Bachelor of Science degree program in **Cybersecurity & Digital Forensics**. The proposal has been approved by all of the necessary internal constituencies at Stevenson University, including the Deans' Council, the Faculty Council, President Elliot Hirshman, and our Board of Trustees.

In compliance with MHEC's request, we are submitting this cover letter and the proposal as PDF attachments to an e-mail message. We have also submitted under separate cover the required filing fee in accordance with MHEC procedures.

Please contact me at 443-334-2205 or at sgorman@stevenson.edu if you have questions. Thank you for consideration of our proposal.

Sincerely,

Susan Thompson Gorman, Ph.D.
Executive Vice President and Provost
Office of Academic Affairs
Stevenson University
443-334-2205
sgorman@stevenson.edu

MARYLAND HIGHER EDUCATION COMMMISSION

ACADEMIC PROGRAM PROPOSAL

PROPOSAL FOR:

__X__ **NEW INSTRUCTIONAL PROGRAM**

_____ **SUBSTANTIAL EXPANSION/MAJOR MODIFICATION**

_____ **COOPERATIVE DEGREE PROGRAM**

____ **WITHIN EXISTING RESOURCES or __X__ REQUIRING NEW RESOURCES**

(For each proposed program, attach a separate cover page. For example, two cover pages would accompany a proposal for a degree program and a certificate program.)

Stevenson University
Institution Submitting Proposal

Fall, 2018
Projected Implementation Date

Bachelor of Science
Award to be Offered

Cybersecurity and Digital Forensics
Title of Proposed Program

079900
Suggested HEGIS Code

11.1003
Suggested CIP Code

Brown School of Business & Leadership
Department of Proposed Program

Aris Melissaratos
Name of Department Head

Stevenson University Online
Department of Proposed Program

Joyce K. Becker, JD
,Name of Department Head

Susan T. Gorman, Ph.D.
Contact Name

sgorman@stevenson.edu
Contact E-Mail Address

443-334-2205
Contact Phone Number

Elliott Hirl 2/15/18
Signature and Date

President/Chief Executive Approval

February 14, 2018
Date

Date Endorsed/Approved by Governing Board

Stevenson University
Brown School of Business and Leadership
Stevenson University Online
Proposal for New Academic Program
Bachelor of Science in Cybersecurity and Digital Forensics

A. Centrality to institutional mission statement 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.*

Description of BS in Cybersecurity and Digital Forensics

The Brown School of Business and Leadership (BSOBL) and Stevenson University Online (SUO) at Stevenson University (Stevenson or the University) are proposing to offer a Bachelor of Science in Cybersecurity and Digital Forensics. BSOBL will offer the degree to traditional students in a face-to-face format. SUO will offer the degree to working adult students in a fully online format. The proposed program combines cybersecurity concepts and skills with those in the field of digital forensics, creating a unique degree program not currently offered by any other Maryland institution. The emphasis of the program will be on the prevention, detection and mitigation of cyber-attacks, combined with the ability to gather digital evidence and conduct electronic crime investigations.

How the Bachelor's Degree in Cybersecurity and Digital Forensics Relates to Stevenson University's Approved Mission

Stevenson University's approved mission is as follows:

> The University is an innovative, coeducational, independent institution offering undergraduate and graduate students a career-focused education marked by individualized attention, civility, and respect for difference. The University blends the liberal arts with career exploration and planning, complementing a traditional education with applied learning beyond the classroom. The University meets students where they are and supports and challenges them to become reflective and accomplished individuals committed to a lifetime of learning and contribution. Students graduate with the competence and confidence needed to address creatively the opportunities and problems facing their communities, the nation, and the world.

The BS in Cybersecurity and Digital Forensics will equip students with the ability to visualize and achieve excellence in a dynamic global community. Students will graduate with the competence and confidence needed to address creatively the cyber-related opportunities and problems facing their communities, the nation, and the world. Creation of this program is

consistent with Stevenson's mission and goals as a career-focused university and will enable Stevenson to respond to the demand in the field.

Stevenson University's mission is to provide a distinctive career-focused and personalized environment for its students. The academic cornerstone of this mission is to develop degree programs whose nuclei have a solid grounding in the liberal arts and sciences, combined with a strong professional proficiency. The proposed program in Cybersecurity and Digital Forensics is designed to support this objective. The program will blend the liberal arts with career exploration and planning, complementing a traditional education with applied learning beyond the classroom. The degree advances a career-focus with a liberal arts foundation in science/math, the humanities, and the social sciences. It also will include two writing intensive courses in the major, one at the 200 level and the second at the 300 level, that will provide additional emphasis in critical thinking and communication.

Stevenson University has a long history of rising to the challenge to provide its students with the education demanded of them by employers. This proposed program is in direct response to market demands in Maryland and in the region, as demonstrated in Section C of this proposal.

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

How the Bachelor's Degree in Cybersecurity and Digital Forensics Supports Stevenson University's Goals

The proposed program supports Stevenson University's strategic goals.

The University's 2017-2018 Business Plan, which flows directly from the University's Strategic Plan, includes the following goals and objectives within the strategic area of Academic Affairs. The proposed program directly supports these goals.

Strategy 1: ACADEMIC AFFAIRS

The University will support faculty and students in their pursuit of academic excellence by integrating academics with experiential learning and career preparation, and by establishing a solid liberal arts foundation.

> *Goal 2: Deliver a distinctive, inclusive student learning experience supported by the provision of robust academic services and high-impact practices.*
>
> *Objective D: Acquire equipment, materials, facilities, and supplies in alignment with industry standards and curricular best practices.*

The proposed program will provide a state-of-the art learning experience to students who can immediately transfer their skills to the workplace. Use of simulation software and the ability to apply classroom learning into a hands-on experience provides a distinctive student learning

experience. Student academic support services at both BSOBL and SUO will facilitate an increase in completion, as students will be able to leverage robust academic services even if they are working.

The program in Cybersecurity and Digital Forensics will utilize state-of-the art software and hardware to provide students an integrated learning experience whereby they will be able to practice the skills they are learning in the classroom, whether face-to-face or online. Combining these two areas of study will provide students with a unique set of skills easily transferred to the workplace

Goal 5: Increase enrollment across all schools of the University.

Objective A: Increase enrollment by establishing new cost effective degree programs that align with the mission and values of the University and reflect career trends and market demands.

This program will meet Goal 5, Objective A by implementing a new BS in Cybersecurity and Digital Forensics that addresses a critical market need and helps to advance the career of computer professionals and community college graduates in the region.

In addition to the University's 2017-2018 Business Plan, University-Wide Initiatives were adopted for 2017-2018 by each University Division. The Academic Affairs Divisional Initiatives includes the following initiative for traditional (e.g., BSOBL) enrollments:

Goal 1 Initiative: Engage in Program Development

The Academic Affairs Divisional Initiatives includes the following initiative for SUO:

Goal 4 Initiative: Develop and launch new program options (certificate and degree programs) to increase enrollment.

This program will meet these two Academic Affairs Divisional Initiatives by implementing a new BS in Cybersecurity and Digital Forensics that will increase enrollments while at the same time addressing a critical market need.

Evidence Affirming That the Bachelor's Degree in Cybersecurity and Digital Forensics Is a Stevenson University Priority

The University's Board of Trustees, President's Cabinet, Dean's Council, and Faculty Council have affirmatively concluded that the B.S. in Cybersecurity and Digital Forensics is central to the University's priorities.

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

The world will need to have more specialists with the knowledge and expertise to handle the cyber-crimes that occur with the increased use of computers around the world. There has been an unprecedented increase in the number of cyber-attacks and hacking incidents in the U.S. and the world. These incidents cost billions and underscore the need for personnel trained to provide security and tracking. The Maryland region is home to banking industry giants, major hospitals, corporations, and a large number of federal, state and local agencies that require cybersecurity and digital forensics professionals capable of protecting digital resources and identifying criminal activity related to those resources. This degree will prepare cybersecurity and digital forensics professionals to respond to this growing demand and will contribute to the need for the advancement and evolution of knowledge in the cyber and digital fields.

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

The proposed program in Cybersecurity and Digital Forensics is well aligned with Goals 1, 4 & 5 of *Maryland Ready*, the 2013-2017 Maryland State Plan for Postsecondary Education. http://mhec.maryland.gov/Documents/MHECStatePlan_2014.pdf

Goal 1: Quality and Effectiveness

This program aligns with Maryland's goal to enhance "its array of postsecondary education programs" towards fulfilling the "evolving needs of its students, the State and the nation" (p. 17). The program proposed here fulfills the need to prepare students to "advance in their careers…emphasizing ethical principles and practices in …professional interactions:" (p.18) The adjunct faculty who teach in this program will be working professionals who will "provide invaluable benefits to students and…offer certain kinds of specialized instruction." (p.19) Finally, the program is supported by a strong staff of student enrollment counselors and success coaches that help bolster students and foster success and retention. Stevenson provides a network of services as part of its Student Success model both in BSOBL and SUO to assist students in earning their degrees.

The University intends to develop transfer articulation agreements with community college that will facilitate degree completion and provide a clear pathway to graduation and employment.

Goal 4: Innovation

This program is consistent with Maryland's aspiration as a leader in "the exploration, development, and implementation of creative and diverse education and training opportunities." Stevenson University has been a state leader among the independent college and university community in facilitating non-traditional student access to education through online programming – programming that is meeting the state's goal for providing new, transformative approaches to delivering instruction and implementing new systems of facilitating student success. (p.44) The SUO program incorporates appropriate technology to facilitate the delivery of quality education that enhances learning and increases information literacy. The BSOBL program is also enhancing the programming by offering a much needed program to facilitate continued state growth in this cyber industry.

Goal 5: Economic Growth and Vitality

The proposed program aligns well with Maryland's goals for economic growth and vitality. The State of Maryland is home to a large number of financial, government, and private institutions that require the skills of trained cybersecurity and digital forensics professionals. This program will provide trained cybersecurity and digital forensics personnel to help fill the needs for the state-based institutions, training that aligns "with business workforce prerequisites and emerging needs." (p. 52)

Recently, the Maryland State Plan for Postsecondary Education was revised. The proposed program in Cybersecurity and Digital Forensic is also aligned with several strategies contained in the more recently published 2017-2021 Maryland State Plan for Postsecondary Education, *Increasing Student Success with Less Debt.* *http://mhec.maryland.gov/About/Documents/2017.2021%20Maryland%20State%20Plan%20for%20Higher%20Education.pdf.* According to the *The Computing Technology Industry Association 2017* report, referenced in the State Plan (p. 12) "Maryland ranks fifth in the concentration of tech jobs in the private sector workforce (8.6%) and sixth in the tech concentration in the total workforce (7%)." The State, Regional and National BLS Occupational Projections Data a contained below in Section C of this proposal contains data that reflects the strength of Maryland in the technical workforce field and need for technical personnel.

The new State Plan is segmented into three sections, Access (ensure equitable access to affordable and quality postsecondary education for all Maryland residents); Success (promote and implement practices and policies that will ensure student success); and Innovation (foster innovation in all aspects of Maryland higher education to improve access and student success). The proposed program aligns with the following strategies:

Access - Strategy 3: Expand efforts to cultivate student readiness, financial literacy, and financial aid for individuals outside traditional K-12 school channels.

This program specifically is designed to attract non-traditional students who have completed community college programs and desire to specialize their education and training even as they

work and raise families. "As the audience for higher education has expanded to include new generations, new communications tools, new family structures, and new populations outside secondary schools, it is important that the postsecondary community in Maryland utilize the power of other resources to reach both traditional and non-traditional students." (p. 40) The State recognizes the need to provide policies and programs to serve these non-traditional populations and the program described here has been designed to create a pathway to enroll and support non-traditional students seeking to attain a bachelor's degree. The unique career services and success coach models for SUO student support facilitate the specific needs of non-traditional students. The program has been designed to easily transition students from community college to bachelor's degree programs.

Success – Strategy 5: Ensure that statutes, regulations, policies, and practices that support students and encourage their success are designed to serve the respective needs of both traditional and non-traditional students.

The proposed program supports Strategy 5. This program is designed to be completed online so that the personal and professional needs of working non-traditional adults can be realized. The program will provide the access to practices that serve their needs specifically and target the specific education and training that they will need to continue to succeed in their profession. The program has been designed to reflect industry needs in the State and contains courses that support student development in critical thinking, problem solving, and communication in the fields of cybersecurity and digital forensics.

The career services offices provide support, the digital library facilities are available 24/7 and the curriculum has been designed so that course activities and communication are facilitated. The curriculum has been designed to foster degree completion through flexible transfer policies and it is anticipated that this program will link directly with community college programs through planned 2 + 2 negotiated pathways for both traditional and non-traditional students.

Further, the online modality of the program expands non-traditional student access and success. SUO has a long history of developing and delivering online degree programs to non-traditional students

Strategy 6: Improve the student experience by providing better options and services that are designed to facilitate prompt completion of degree requirements.

"Improving the transfer experience, [and] developing focused pathways ….support the State." (p. 56) Maximizing statewide transfer for students has long been an area of concern and the state wants to ensure that university policies and procedures are welcoming and supportive for students. The program proposed here has been created after discussions with area community colleges and designed to complement previous courses completed at the community college. This will facilitate time to degree by eliminating redundant courses and providing a focused pathway to degree completion.

Strategy 7: Enhance career advising and planning services and integrate them explicitly into academic advising and planning.

The program proposed here is supported by Stevenson's unique career services model. Students are exposed to career advising beginning with the freshman year (traditional students) and with enrollment (non-traditional students). All BSOBL and SUO students have access to an Industry Specialist for career advising. The Office of Career Services provides extensive onsite and virtual services to students. Online courses integrate information regarding career services and students can take advantage of these services either online or onsite. Strong academic advising is available through the student success coaches located onsite for traditional students and online for non-traditional students. Students can seek out these services as they need them to bolster self-confidence and seek assistance.

Innovation – Strategy 9: Strengthen and sustain development and collaboration in addressing teaching and learning challenges

This program supports Strategy 9 through the utilization of innovated strategies for teaching and learning. (p. 70) The implementation of new virtual lab hardware and state-of-the-art software engage students in real-world problems solving in the field of cybersecurity and digital forensics. Using these technologies promotes discussions of innovative strategies for the classroom and online environments. Further, faculty will take advantage of professional development activities to promote use of new teaching and learning strategies in the classroom and online as they develop new methods for engaging students in creative and collaborative learning.

C. Quantifiable & reliable evidence and documentation of market supply & demand in the region and State:

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

The need for cybersecurity and digital forensics professionals is well documented. Estimates for unfilled jobs in the profession range from the tens to hundreds of thousands nationally. In Maryland, there is an especially critical need due to the proximity of the Federal Government, the military and government contractors. Major agencies located in Maryland needing cyber-professionals include the US Cyber Command, National Security Agency, National Institute of Standards and Technology, and the Defense Information Systems Agency.

According to an analysis by Forbes in 2016 (https://www.forbes.com/sites/stevemorgan/2016/01/02/one-million-cybersecurity-job-openings-in-2016/#3180fc0227ea), more than 209,000 cybersecurity jobs are unfilled and job postings are up by 74% over the past four years. Forbes cites a Cisco report (https://www.cisco.com/c/dam/en/us/products/collateral/security/cybersecurity-talent.pdf) that puts the global figure at one million cybersecurity job openings. The job market expands even greater when cybersecurity and digital forensics are combined. A review at CSO Online

(https://www.csoonline.com/article/3201974/it-careers/cybersecurity-job-market-statistics.html) lists several sources documenting a severe workforce shortage in these fields.

2. *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 following Tables enumerate the Bureau of Labor Statistics' (BLS) estimates of the job growth in information security analysts and related fields between 2014 and 2024. Cybersecurity is not listed as a profession in the BLS Outlook Handbook at this time. The job titles were identified which include cybersecurity-related job responsibilities.

Table C.2.1: Summary of State, Regional and National BLS Occupational Projections Totals

	Base Year 2014	Projected Year 2024	Change	Percent Change
Maryland Totals	**47,330**	**62,170**	**14,840**	**31.4%**
Regional Totals	**206,570**	**250,080**	**43,510**	**21.1%**
US Totals	**1,501,800**	**1,732,400**	**230,700**	**15.4%**

Table C.2.2: Maryland Data – BLS Occupational Projections Data by Profession

Maryland Data		Base Year 2014	Projected Year 2024	Change	Percent Change
Computer and information systems managers	11-3021	9,780	12,270	2,490	25.5%
Computer systems analyst	15-1121	15,790	21,570	5,780	36.5%
Information Security Analysts	15-1122	3,510	5,340	1,830	52.0%
Database Administrator	15-1141	4,040	5,180	1,140	28.2%
Network and computer systems administrators	15-1142	14,210	17,810	3,600	25.4%
Total Maryland		**47,330**	**62,170**	**14,840**	**31.4%**

Table C.2.3: Regional Data – BLS Occupational Projections Data by Profession

		Base Year 2014	Projected Year 2024	Change	Percent Change
Computer and information systems managers	11-3021				
Delaware		1,120	1,260	140	12.6%
DC		4,360	4,580	220	5.1%
Maryland		9,780	12,270	2,490	25.5%
Pennsylvania		11,170	13,090	1,920	17.2%
Virginia		14,280	17,170	2,890	20.3%
West Virginia		760	830	70	8.8%
Regional Total		**41,470**	**49,200**	**7,730**	**18.6%**
Computer systems analyst	15-1121				
Delaware		3,280	4,000	720	21.8%
DC		4,030	5,070	1,040	25.7%
Maryland		15,790	21,570	5,780	36.5%
Pennsylvania		24,030	29,030	5,000	20.8
Virginia		28,090	35,180	7,090	25%
West Virginia		760	910	150	18.9%
Regional Total		**75,980**	**95,760**	**19,780**	**26.0%**
Information Security Analysts	15-1122				
Delaware		250	290	40	14.5%
DC		980	1,220	240	24.0%
Maryland		3,510	5,340	1,830	52.0%
Pennsylvania		2,470	2,890	420	17.1%
Virginia		10,290	13,030	2,740	26.6%
West Virginia		160	190	30	23.9%
Regional Total		**17,660**	**22,960**	**5,300**	**30.0%**

		Base Year 2014	Projected Year 2024	Change	Percent Change
Database Administrator	15-1141				
Delaware		470	520	50	11.3%
DC		1,100	1,240	140	13.3%
Maryland		4,040	5,180	1,140	28.2%
Pennsylvania		5,540	6,110	570	10.2%
Virginia		5,510	6,340	830	15%
West Virginia		580	600	20	2.9%
Regional Total		**17,240**	**19,990**	**2,750**	**16.0%**
Network and computer systems administrators	15-1142				
Delaware		1,120	1,210	90	7.5%
DC		3,160	3,690	530	16.8%
Maryland		14,210	17,810	3,600	25.4%
Pennsylvania		14,850	15,790	940	6.4%
Virginia		19,800	22,570	2,770	14%
West Virginia		1,080	1,100	20	2.5%
Regional Total		**54,220**	**62,170**	**7,950**	**14.7%**

Table C.2.4: Summary Regional Data BLS Occupational Projections Data by Profession

Regional Data		Base Year 2014	Projected Year 2024	Change	Percent Change
Computer and information systems managers	11-3021	41,470	49,200	7,730	18.6%
Computer systems analyst	15-1121	75,980	95,760	19,780	26.0%
Information Security Analysts	15-1122	17,660	22,960	5,300	30.0%
Database Administrator	15-1141	17,240	19,990	2,750	16.0%
Network and computer systems administrators	15-1142	54,220	62,170	7.950	14.7%
Total Regional		**206,570**	**250,080**	**43,510**	**21.1%**

Table C.2.5: US Data – BLS Occupational Projections Data by Profession

United States Data		Base Year 2014	Projected Year 2024	Change	Percent Change
Computer systems analyst	15-1121	567,800	686,300	118,600	20.9%
Information Security Analysts	15-1122	82,900	97,700	14,800	17.9%
Network and computer systems administrators	15-1142	382,600	412,800	30,200	7.90%
Database Administrator	15-1141	120,000	133,400	13,400	11.1%
Computer and information systems managers	11-3021	348,500	402,200	53,700	15.4%
Total US		**1,501,800**	**1,732,400**	**230,700**	**15.4%**

All of the indicators of demand for cybersecurity graduates in the state, region, and nation underscore the fact that the cybersecurity job market is strong and undergoing rapid growth. With cyber-attacks on the rise, more and more companies are hiring security specialists to protect against and respond to attacks. Likewise, government agencies, such as the National Security Agency and Department of Defense, and other agencies centered in the Maryland area are expanding their cybersecurity workforce to deal with these cyber threats.

3. *Data showing the current and projected supply of prospective graduates.*

While there clearly have been a proliferation of degrees in cybersecurity programs across the state, the majority of these programs are concerned primarily with the technical side of networking and cybersecurity. What distinguishes the Stevenson program in Cybersecurity and Digital Forensics is the emphases on prevention, detection and mitigation of cyber-attacks.in combination with collecting digital evidence and conducting electronic crime investigations. The proposed program combines the traditional cybersecurity program with digital forensics creating a unique degree program not currently offered. The program will draw upon Stevenson's strong background in digital forensics as a Center of Digital Forensics Academic Excellence (CDFAE) and provide a differently focused degree program. The program will further align with Maryland's and surrounding state community college programs to provide a seamless path to the bachelor's degree.

Currently, over 1900 students are registered in Cybersecurity or Information Security programs within the community colleges in Maryland. The most recent figures from MHEC indicate that 281 completed the AS degree program in 2016. Additionally, the community colleges data

shows that between 200 – 300 students are enrolled in a Lower Division Certificate in these same fields. Among the bachelor's degree granting programs, MHEC 2016 data shows approximately 3200 students enrolled in a related program. Over 2500 of these students are enrolled at UMUC which means that these students can be located anywhere and work anywhere, not necessarily in Maryland or the surrounding region.

In January of 2015, the U.S. Department of Labor awarded 14 Maryland community colleges nearly $15 million in federal grant funding from the Trade Adjustment Assistance Community College and Career Training competitive grant program. This grant was designed to support job-driven training programs. These 14 community colleges from across the state of Maryland will work in partnership with key employers including IBM, Ratheon, Lockheed Martin, Rockwell Collins, Booz Allen, MedStar and a number of other hospitals to develop training pathways for low-income workers with minimal prior education or experience in information technology or cybersecurity. Students in this grant program will have the opportunity to accelerate through a two-year degree that is aligned with NSA guidelines for Security & Information Assurance programs. In the next three years, this program intends to graduate nearly 2,000 students. This places Stevenson University in the perfect position to enter into articulation agreements with these community colleges to offer the BS in Cybersecurity and Digital Forensics to these community college graduates.

Community college students who enroll in Stevenson's BS in Cybersecurity and Digital Forensics program will also have the opportunity to enroll in Stevenson's BS to MS option. Enrollment in this option would allow these students to earn as many as 18 master's degree credits while completing their undergraduate degree. With the level of coursework covered at their respective community college and the expanded higher level course content covered in the proposed program, these students would be suitable for enrollment in the BS to MS option in Business & Technology Management, Digital Forensics, Forensic Investigations, or Forensic Studies This option would be open to students entering either the BSOBL or the SUO offering of the B.S. in Cybersecurity and Digital Forensics program.

Data from the Trends in Degrees and Certificates by Program Maryland Higher Education Institutions 2003-2016, from representative institutions with potential graduates in the field of cybersecurity is listed below. As can be seen, the total number of graduates from these programs (not all of whom will be entering cybersecurity fields) clearly is well below the needs of the State and region.

Institution		CIP Code	2014	2015	2016
Bowie	computer science	110101	11	9	14
		119999	20	27	38
Frostburg	Secure Computing & Info Assurance	111003	0	0	6
	Computer Science	110701	17	19	18
Towson	Computer Science Track*	110701	65	64	83

Institution		CIP Code	2014	2015	2016
UMCP	Computer Science Track*	110101	218	283	303
UMUC	Computer Networks and Security**	110401	300	379	437
	Cybersecurity**	111003	313	439	465
	Software Development and Security**	110101	146	192	185
Morgan	Computer Science*	110101	10	9	8
	no data from Engineering				
Capitol	Cyber and Information Security	119999	13	20	22
TOTAL DEGREES GRANTED			**1113**	**1441**	**1579**

* Cannot distinguish Cyber Track graduates vs non-Cyber Track computer science graduates

**Cannot distinguish whether any of these graduates are located in Maryland or the surrounding region

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.*

The following programs in Maryland have been identified through either 1) MHEC's list of approved bachelor's programs or 2) Maryland-located Centers of Academic Excellence (CAE) in Cyber Defense:

- Bowie State University – BS in Computer Technology or Computer Science w/ Core Knowledge Units Certificate
- Capitol Technology University – B.S. in Cyber and Information Security
- Capitol Technology University – B.S. in Management of Cyber and Information Technology
- Frostburg State University – B.S. in Secure Computing and Information Assurance
- Johns Hopkins University – B.S. in Computer Science with a focus on Computer Security
- Morgan State University – B.S. in Electrical Engineering with a Cyber Track
- Mount St. Mary's University – B.S. in Cybersecurity
- Towson University – B.S. in Computer Science (Computer Security Specialization)
- University of Maryland University College – B.S. in Computer Networks and Security
- University of Maryland University College – B.S. in Cybersecurity Management and Policy
- University of Maryland University College – B.S. in Software Development and Security
- University of Maryland, College Park – B.S. in Computer Science (Cybersecurity Specialization)

A review of required coursework in the above-listed programs was undertaken. The similarities/ differences between these programs and the program proposed by Stevenson are as follows:

- Bowie State University – The B.S. in Computer Technology or Computer Science with Core Knowledge Certificate is a technical computer program with an elective focus in technical network protocols that have utility for cybersecurity, but not a clear focus on cybersecurity as the Stevenson program, and no digital forensics coursework.
- Capitol Technology University – The B.S. in Cyber and Information Security includes cybersecurity but has no digital forensics coursework. The B.S. in Management of Cyber and Information Technology focuses on the business management and administration of information security and technology, not on cybersecurity or digital forensics,
- Frostburg State University – The B.S. in Secure Computing and Information Assurance focuses solely on the technical side of cybersecurity but does not have any courses in digital forensics.
- Johns Hopkins University – The programs at Hopkins are located within the university's School of Engineering. The program in Cybersecurity/Security Informatics is offered at the master's degree level only. The B.S. in Computer Science with a focus on Computer Security designed for those interested in a more broad based computer science or mathematics degree focused program. This is not the focus of the proposed Stevenson program.
- Morgan State University – The B.S. in Electrical Engineering with a Cyber Track is located within its School of Engineering and the courses, while listed at the 400 level, are elective courses that focus on an Introduction to Cyber Security or Network Security or Communication Security or Security Management – all with a clear engineering focus. This is not the focus of the proposed Stevenson program.
- Mount St. Mary's University – The B.S. in Cybersecurity is the most recent program in Cybersecurity offered by a Maryland institution. The program focuses on "computer science, criminological and criminal justice components of the cyber world." (http://msmary.edu/School_of_natural_science_and_math/Undergraduate_Programs/cybersecurity.html). The program can also be taken as an 18 credit interdisciplinary minor open to all students regardless of major. The program is not focused on digital forensics and is grounded in a broader liberal arts focus than the proposed Stevenson program.
- Towson University – The B.S. in Computer Science (Computer Security Specialization) is a major in computer science with a track in computer security. The program's focus is on computer, network and operating systems security. This is not the focus of the proposed Stevenson program.
- University of Maryland University College – While the B.S. in Computer Networks and Security, the B.S. in Cybersecurity Management and Policy, and the B.S. in Software Development and Security align somewhat with the cybersecurity courses in the proposed Stevenson program, none of these programs include coursework in digital forensics.
- University of Maryland College Park – The B.S. in Computer Science (Cybersecurity Specialization) offers a Cybersecurity Specialization within a Computer Science degree. The cybersecurity courses are not of the depth or breadth of the courses in the proposed

Stevenson program. Further, there are no digital forensics courses as in the proposed Stevenson program.

In summary, while a number of Maryland institutions offer in cybersecurity programs across, the majority of these programs are concerned primarily with the technical side of networking and cybersecurity. The proposed B.S. in Cybersecurity and Digital Forensics is unique in providing theoretical and practical experience in combining the skills of two fields critical to addressing the local, regional, and national need for trained personnel to address the growing problems of cybercrime. What distinguishes the Stevenson program is the emphases on prevention, detection and mitigation of cyber-attacks.in combination with collecting digital evidence and conducting electronic crime investigations. The proposed program combines the traditional cybersecurity program with digital forensics creating a unique degree program not currently offered.

2. *Provide justification for the proposed program.*

As noted above in Section C, the need for cybersecurity and digital forensics professionals is well-documented. Estimates for unfilled-jobs in the profession range from ten to hundreds of thousands nationally. The number of graduates in the field from Maryland institutions is clearly well below the needs of the state and region.

There are countless task forces, commissions, working groups and consultant reports that seek to define and address the shortage of cybersecurity professionals, many in Maryland. For example:

- The National Initiative for Cybersecurity Education (NICE), led by the National Institute of Standards and Technology (NIST), is a partnership between government, academia, and the private sector with the mission "to promote a network and ecosystem of cybersecurity education, training, and workforce development" (NICE, 2016).
- The Commission on Maryland Cybersecurity and Excellence was created by the state government to "provide a road map for making the State the epicenter of cybersecurity and excellence." (Commission on Maryland Cybersecurity Innovation and Excellence, 2014).
- The Defense Cyber Crime Center (DC3) is a Department of Defense (DoD) agency with the mission to deliver digital forensics and other services for the military and law enforcement. One of its components is the Defense Cyber Investigations Training Academy (DCITA), which delivers training to DoD personnel in several cybersecurity specialty areas, including digital forensics.
- DC3 administers a program whereby schools nationwide are designated as Centers of Digital Forensics Academic Excellence (CDFAE). Stevenson is one of thirteen schools with this designation.

The need for Stevenson's B.S. in Cybersecurity and Digital Forensics can be summarized by the following statement contained in *Cybersecurity Ventures*, accessed at https://cybersecurityventures.com/hackerpocalypse-cybercrime-report-2016/ on 01/26/2018):

The sheer volume of cyberattacks and security events triaged daily by security operations centers continues to grow, making it nearly impossible for humans to keep pace, according to Microsoft's Global Incident Response and Recovery Team.

Security is a people problem. People are committing the cybercrimes. And we need qualified people to pursue and catch the perpetrators. Technology is essential and we are making a lot of progress there, but without a sufficient army of white hats (good guys) to go up against the growing army of black hats (bad guys), we will not be able to bring down the cybercrime rate.

"The greatest virtual threat today is not state sponsored cyber-attacks; newfangled clandestine malware; or a hacker culture run amok" states John Reed Stark, former Chief of the SEC's Office of Internet Enforcement, in a guest blog post he recently wrote. "The most dangerous looming crisis in information security is instead a severe cybersecurity labor shortage."

E. Relevance to high-demand programs at Historically Black Institutions (HBIs)

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

Bowie State University offers a B.S. in Computer Technology or Computer Science with Core Knowledge Certificate and Morgan State University offers a B.S. in Electrical Engineering with a Cyber Track. However, as discussed more fully below, these programs are not duplicative with this proposed Stevenson program. Therefore, Stevenson's proposed program will have no impact on the implementation or maintenance of high demand programs at HBIs.

Bowie State University has created a Center for Cyber Security and Emerging Technologies (C_2ET) which provides educational, research and training opportunities in network and information security as a joint effort between their Departments of Computer Science and Management Information Systems. This center serves as the primary interface with the U.S. National Security Agency (NSA) and the Department of Homeland Security (DHS) regarding education and training in Information Assurance and requirements and obligations regarding the university's designation as a center of academic excellence in information assurance education. Bowie State's Department of Computer Science offers a Bachelor of Science degree in Computer Technology with a concentration in computer and network security. http://www.cs.bowiestate.edu/cnis/index.html

Bowie State's Computer Technology degree (CTEC) offered by their Department of Computer Science has as part of its program description to apply available technology to solve practical problems for end users. http://www.cs.bowiestate.edu/Academics/computer%20technology.html As part of obtaining this degree, students can choose between one of four tracks. Those tracks are Internet Technology & Multimedia, Networking & System Administration, Database Development & Administration, and Computer & Network Security. The CETC program track

in Computer & Network Security will provide successful students with the tools to become information assurance and security professionals.

The five upper level courses currently taught in this track are Network Protocols (TCP/IP, Foundations of Computer and Network Security, Principles & Methods of Intrusion Detection and Prevention, Software & Operating Systems Security, and Fundamentals of Cryptography & Applications. While these five courses are part of Bowie's Computer and Network Security track, their stated focus is towards students seeking a career in information assurance and security. Stevenson new program in Cybersecurity and Digital Forensics is a combination of courses from their two existing tracks (Network Security and Computer Forensics) along with a series of new courses in both areas of Cybersecurity and Digital Forensics.

Bowie State University has specifically stated their CTEC track provides successful students the necessary tools to become Information Assurance specialists which is different from a career in Cybersecurity. Cybersecurity focuses on preventing and defending against attacks and unauthorized use of computer systems, including networks, programs and data. Risk management is a key component of cyber security as potential threats are identified, analyzed, and evaluated to determine what time of action, if any, should be taken. Prevention, using firewalls and other deterrence measures, is another aspect of the cyber security profession. Information Assurance on the other hand can be characterized as the ability to be confident information systems will perform as needed and be accessible for authorized users only. Information assurance can include cryptography, data analysis and is a bit broader in its scope when compared to cyber security.

Stevenson's proposed program is being developed for those students specifically seeking a career in either cybersecurity or digital forensics or a combination of both. Bowie State's CTEC program track does not include any digital forensics and the difference between information assurance and cybersecurity demonstrates a unique separation between these two programs. Bowie State's focus on information assurance is only with a track while Stevenson University's program is a degree program and thus very different in scope and intent

The program at Morgan State University is designed as a track entitled Electrical Engineering Cyber Security and is part of the degree program in Electrical Engineering. The track was created in response to Morgan State University's designation as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) in September, 2016. This designation is awarded by the National Security Agency (NSA) and the U.S. Department of Homeland Security (DHS) to institutions that are involved in efforts to advance research in and prepare students for careers in internet security. (2016, September 2). Retrieved from http://news.morgan.edu/morgan-designated-as-center-of-academic-excellence-by-the-nsa-the-department-of-homeland-security/

The track's five courses cover topics in communications networks, **introduction** to cyber security, **introduction** to network security, **introduction** to communications security, and **introduction** to security management. These courses are intended to be taken during a student's senior year, with four of the five courses satisfying the student's senior level electives required

for all electrical engineering students and the fifth course is used to satisfy one of the non-electrical engineering electives. The intention of these five courses is to provide the graduates of Morgan State University's undergraduate degree in Electrical Engineering skills at the introductory level in the emerging discipline of Cyber Security Engineering. None of these courses includes objectives related to digital forensics—or the more in-depth background in cybersecurity and/or digital forensics that the bachelor's degree program affords Stevenson students.
http://www.morgan.edu/school_of_engineering/departments/electrical_and_computer_engineering/niess-cae.html

Stevenson University has also been designated as a Center for Digital Forensics Academic Excellence (CDFAE) by The Defense Cyber Crime Center, headquartered in Linthicum, Maryland. The mission of CDFAE is to develop a partnership between academia and the government to establish standards and best practices for digital forensics practitioners, educations, and researchers to advance the discipline of digital forensics and increase the number of qualified professionals in the law enforcement, counterintelligence, national defense, and legal communities. (2014, September 26) http://www.stevenson.edu/about/news-events/news/stevenson-computer-information-systems-programs-earn-accreditation-from-defense-cyber-crime-center . Stevenson does not believe that its proposed program is duplicative of the MSU program nor will its degree program be in competition for students from Morgan State University training to become electrical engineers with a minimum background in cybersecurity.

In conclusion, the proposed program are not duplicative of the programs offered by Bowie State University and Morgan State University. Therefore, Stevenson's proposed program will have no impact on the implementation or maintenance of high demand programs at Historically Black Institutions.

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

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

As noted above, Bowie State University offers a B.S. in Computer Technology or Computer Science with Core Knowledge Certificate and Morgan State University offers a B.S. in Electrical Engineering with a Cyber Track. However, as also discussed above, these programs are not duplicative with the proposed Stevenson program. Therefore, Stevenson's proposed program will have no impact on the uniqueness and institutional identities and missions of any Historically Black Institution.

G. Adequacy of curriculum design and delivery to related learning outcomes consistent with Regulation .10 of this chapter

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

The requirements for the B.S. in Cybersecurity and Digital Forensics are as follows:

Total credit hours for major requirements:	69
Total credit hours for general education:	42
Total credit hours for general electives:	9
Total credit hours for the degree:	120

The following major courses are required for the B.S. in Cybersecurity and Digital Forensics:

Course Number	Course Title	Semester Credits
CDF 110	Cybersecurity and Digital Forensics Fundamentals	3
CDF 240	Linux System Administration	3
CDF 251	Network Security	3
CDF 252	Networking II	3
CDF 261	Digital Forensics	3
CDF 271	Intrusion and Penetration Testing	3
CDF 281	Advanced Network Defense	3
CDF 290	Risk Management, Legal Frameworks, and Compliance in Cybersecurity	3
CDF 391	Incident Response and Investigation	3
CDF 392	Information Systems Forensics Internals-Auditing	3
CDF 393	Forensic Evidence Collection Tools and Techniques	3
CDF 475	Advanced Digital Forensics	3
CDF 480	Cybersecurity and Digital Forensics Capstone	3
IS 140	Information Systems Architecture and Design	3
IS 231	Network Technologies	3
IS 232	TCP and IP Communication Protocols for Windows and UNIX	3
IS 235	Advanced Windows Server Architecture and Administration	3
IS 240	Programming Concepts	3
IS 331	CISCO TCP and IP Routing	3
IS 365	Writing for IS Applications	3
IS 432	Network Security-Firewalls, IDS, and Counter Measures	3
MGT 210	Business Writing	3
Elective	Business Elective	3
	Total Credits:	**69**

Course Descriptions

CDF 110 – Cybersecurity and Digital Forensics Fundamentals (3 credits)
Investigates planning, installing, configuring, administering and troubleshooting of the Linux system server environment. Students will explore topics including Linux architecture, hardware requirements, installation methods, command line usage, file permissions, directory layout and

special programs. Managing disks and file systems will also, be examined. Administrative topics such as root accounts, log files, users, networking, automated process commands, security, and print services will be covered.
Prerequisite: None

CDF 240 – Linux System Administration (3 credits)
Investigates planning, installing, configuring, administering and troubleshooting of the Linux system server environment. Students will explore topics including Linux architecture, hardware requirements, installation methods, command line usage, file permissions, directory layout and special programs. Managing disks and file systems will also, be examined. Administrative topics such as root accounts, log files, users, networking, automated process commands, security, and print services will be covered.
Prerequisite: A grade of C or better in IS 231

CDF 251 – Network Security (3 credits)
Examines general security concepts, including authentication methods, cryptography basics, and common network attacks. Students will create secure communications for remote access, e-mail, the Web, directory, file transfer, and wireless data. Concepts of physical security and disaster recovery will be explored.
Prerequisite: A grade of C or better in IS 231

CDF 252 – Networking II (3 credits)
Investigates basic switching concepts and technologies such as VLANs and trunking. Switched networks concepts will be explored through configuration, monitoring, and troubleshooting. Router configurations, including static, default, and inter-VLAN will be examined, as well as the necessity for access control lists (ACLs), Dynamic Host Protocol (DHCP) and Network Address Translation (NAT).
Prerequisite: A grade of C or better in IS 231

CDF 261 – Digital Forensics (3 credits)
Explores the traditional relational database design and architecture of data storage in mobile electronic devices. Students will examine the storage of data in the cloud and the ramifications of that storage with respect to digital forensics. Basic techniques for analyzing data, including Structured Query Language, data mining techniques, and social network analysis will be examined. Students will also develop proficiency in scripting languages and learn how to extract and preserve information from files.
Prerequisite: A grade of C or better in CDF 251

CDF 271 – Intrusion and Penetration Testing (3 credits)
Analyzes the techniques, tools, and processes used to penetrate networks, and the countermeasures implemented to protect against these attacks. Students will also examine cybercriminal tools such as malware and scripts.
Prerequisite: A grade of C or better in CDF 251

CDF 281 – Advanced Network Defense (3 credits)
Investigates network defense and countermeasures with a primary focus on intrusion detection and firewall defense mechanisms. Security issues in operating system design and implementation, articulating the steps necessary for hardening the operating system with respect to various applications, and describing the various concepts in network defense will be examined. Students will apply essential security practices and methods to networks and deploy security tools.
Prerequisite: A grade of C or better in CDF 251

CDF 290 – Risk Management, Legal Frameworks, and Compliance in Cybersecurity (3 credits)
Analyzes business risks arising from information security and privacy issues, as well as the creation and implementation of policies that ensure compliance with laws and industry standards. Students will explore topics including privacy laws, payment card industry standards, information security measures mandated by federal statues, governance and policy development, e-discovery, contracts, intellectual property, and security risk assessments.
Prerequisite: None

CDF 391 – Incident Response and Investigation (3 credits)
Scrutinizes the role of the computer forensics investigator as a member of an incidence response team and explores the nature of the threat to organizations, the indicators that an incident is underway, the policies and procedures to be followed when a suspected incident is detected, and the investigation methods used to collect evidence for prevention and/or prosecution. Students will explore the best practices used to create, organize and deploy an incident response team.
Prerequisite: A grade of C or better in IS 231.

CDF 392 – Information Systems Forensic Internals – Auditing (3 credits)
Explores legal and ethical issues, investigative processes, and storage media in digital forensics. Topics will include examining national security crimes, preparing an incident response toolkit, creating a detailed intrusion analysis report, and generating forensic images.
Prerequisite: A grade of C or better in IS 231

CDF 393 – Forensic Evidence Collection Tools and Techniques (3 credits)
Investigates digital forensics related to mobile devices, networks, and software. Topics include Android, Apple iOS, GPS, and BlackBerry OS investigations, using live investigative techniques, producing bootable media of various operating systems, creating forensic images of RAM, and evaluating suspicious software for signs that it could be malware.
Prerequisite: A grade of C or better in CDF 391 and CDF 392

CDF 475 – Advanced Digital Forensics (3 credits)
Evaluates forensics-based examination of operating systems structures, advanced applications of forensics tools, mobile device forensics, and current topics in digital forensics research. The substance of the Department of Defense National Centers of Digital Forensics Excellence (CDFAE) program form the basis for course content and assignments.
Prerequisite: A grade of C or better in CDF 393

CDF 480 – Cybersecurity and Digital Forensics Capstone (3 credits)
Explores developing and implementing an effective cybersecurity program for an organization. Through case studies, readings, review of current trends, projects, and group exercises, students will gain experience in integrating topics from their previous coursework by designing multifaceted, strategic responses to cyber threats and incidents.
Prerequisite: A grade of C or better in CDF 393, IS 365, CDF 290, and CDF 475.

IS 140 – Information Systems Architecture and Design (3 credits)
Examines the component technologies of information system architectures. The course will cover the design principles behind computer hardware and peripheral devices, network components, and network operating systems. Students will explore topics in computer hardware design from handheld devices to large-scale super computers.
Prerequisite: None

IS 231 – Network Technologies (3 credits)
Prepares the student to perform key network configuration and troubleshooting skills used by IT professionals. Students will learn the functional concepts of leading network architectures. Students examine in detail the TCP and IP family of communication protocols, structured cabling systems, fiber optic and wireless systems.
Prerequisite: A grade of C or better in IS 140.

IS 232 – TCP and IP Communication Protocols for Windows and UNIX (3 credits)
Prepares the student in the planning, installation, configuration, and management of a TCP- and IP-based network. Students will learn to monitor, optimize, diagnose, and resolve problems on the network using standard tools and utilities found in the workplace. The internal process of TCP will be examined along with the classic hacking attacks and countermeasure techniques.
Prerequisite: A grade of C or better in IS 231.

IS 235 – Advanced Windows Server Architecture and Administration (3 credits)
Examines the management tools essential for creating, designing, and maintaining a Windows Server Active Directory. Students will learn planning, installation, configuration, and administration and will create from the ground up a network infrastructure using Windows Advanced Server. Domain Name System (DNS), forest designs, site topology and replication, organizational unit structure, group policy and delegation of control are just a few of the essential topics covered in this course.
Prerequisite: A grade of C or better in IS 231.

IS 240 – Programming Concepts (3 credits)
Introduces programming constructs common to most languages, laying a solid foundation on which more advanced topics will build. The course will introduce a modern integrated development environment. Key topics will include object oriented programming design concepts, GUI design guidelines, data structures, and database connectivity. Students will design a series of small business applications linked to a database.
Prerequisite: A grade of C or better in IS 231

IS 331 – CISCO TCP and IP Routing (3 credits)
Examines techniques for deploying quality of service features, route distribution, advanced switching topics (such as VTP, STP, HSRP, VRRP and VOIP), advanced routing topics (such as EIGRP, OSPF, BGP), policy- based routing, IPv6, and route cost determination, all of which improve performance and guarantee delivery of the business' most important data. Students will gain hands-on experience in configuring and managing CISCO routers and switches. Best practices in the design of an effective routed infrastructure will be addressed.
Prerequisite: A grade of C or better in IS 232

IS 365 - Writing for IS Applications (3 credits)
Focuses on effective writing of deliverables typical in the information systems profession. A major theme will be crafting messages with technical content for a non-technical audience. Students will practice developing communications products that they will encounter in their careers, such as instruction manuals, project proposals, managerial briefings, and IT policies.
Prerequisite: A grade of C or better in MGT 210. SEE Certification: Writing Intensive

IS 432 – Network Security – Firewalls, IDS, and Counter Measures (3 credits)
Examines the types of attacks launched by intruders and the system components that offer intrusion prevention, protection, and detection. Students will learn to configure firewalls, Intrusion Prevention, and Intrusion Detection Systems and network analysis tools to protect network resources. Cybercriminal exploits and the countermeasures used to defeat them will be examined in detail. Students will explore various categories of Firewall and IDS network analysis products through comparison and evaluation.
Prerequisite: A grade of C or better in IS 232

MGT 210 – Business Writing (3 credits)
Focuses on the purposes, principles, and techniques of business writing. The course provides students with a review of the basics in writing while using a variety of operational workplace writing exercises. Students will apply advanced critical thinking ability and analytical competencies to develop overall writing ability.
SEE Certification: Writing Intensive

Program Requirements

Students must complete a minimum of 120 semester credits including 69 credits in the major, 42 general education credits, and 9 credits of general electives. Students must earn a minimum GPA of 2.00 in the major, and the lowest acceptable grade is a "C" in all major and Stevenson Educational Experience (SEE) courses. No student, regardless of major, will be permitted to advance to the next course without earning a grade of "C" or better in the prerequisite course(s). When a grade below "C" is earned in a major course, the student must repeat that course.

A course may be repeated twice without special permission. Students must apply in writing to the program coordinator/department chair requesting permission to attempt a course for a third time.

1. *Describe the educational objectives and intended student learning outcomes.*

Upon completion of the B.S. in Cybersecurity and Digital Forensics Degree, graduates will be able to:

1. Develop a security policy for an organization that balances the organization's mission, culture, human factors, and security requirements.
2. Apply risk assessment methodologies in selecting and configuring security controls to protect information assets.
3. Monitor a network infrastructure for cyber-attacks.
4. Mitigate the effects on a network infrastructure due to a cyber-attack.
5. Evaluate an end-to-end computer forensics investigation.
6. Prepare a digital forensics evidence report.

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

As part of the Stevenson Educational Experience (SEE), Stevenson University requires all bachelor's degree-seeking students to complete 15 credits of writing and communication coursework and a minimum of 37-39 credits in distribution areas in liberal arts and sciences. It is expected that courses in a student's major field of study will round out the learning goals and outcomes that constitute the Stevenson Educational Experience.

SEE credits/courses may be included in the major program requirements unless otherwise specified; however, within the liberal arts and sciences distribution requirement, no single course may count in more than one distribution area for the purpose of fulfilling the SEE requirement. Within the writing and communication requirement, it is permitted but not required for a single course to fulfill either a WI or CI requirement and a liberal arts and sciences distribution requirement. Students must earn a minimum grade of "C" in courses that are used to fulfill the SEE requirement.

Writing and Communication Requirement (15 credits).
All students must complete courses that fulfill the SEE Writing and Communication requirement: two writing instruction courses, two writing-intensive (WI) courses, and one communication-intensive (CI) course.

- Two writing instruction courses:
  - ENG 151 – Composition & Writing from Sources (3 credits)
  - ENG 152 – Writing About Literature (3 credits)
- Two WI courses and one CI course
  - WI Courses:
    - A minimum of 2 WI courses are required. Courses that fulfill the WI requirement are labelled "SEE-Certification: Writing Intensive" in the course descriptions.
    - At least one WI course must be in the student's major area of study.

- One WI course must be at the 200-level (fulfilled in the proposed program by MGT 210 – Business Writing)
- One WI course must be at the 300-level or 400-level (fulfilled in the proposed program by IS 365 – Writing for IS Applications)

- CI Course:
  - One CI course is required. Courses that fulfill the CI requirement are labelled "SEE-Certification: Communication Intensive" in the course descriptions.

A single course may fulfill either a WI or CI standard. No single course may count as both writing intensive and communication intensive. It is permitted but not required for a single course to fulfill either a WI or CI requirement and a liberal arts and sciences distribution requirement.

Liberal Arts and Sciences Distribution Requirement (37-39 credits).
All bachelor's degree-seeking students must complete courses that fulfill the SEE liberal arts and sciences distribution requirement. No single course may count in more than one distribution area for the purpose of fulfilling the SEE requirement, even though a course may meet the standards in more than one distribution area. Students must complete the required number of credits in each of the four areas described below: humanities, science and mathematics, social sciences, and fine arts.

Humanities (HUM; 12 credits)
Four courses in at least three different discipline areas are required. The discipline areas are represented by the course prefix designators that precede the course number in the catalog (e.g., PHIL, REL). Courses that fulfill the humanities distribution requirement are labelled "SEE-Certification: Humanities" in the course descriptions. ENG 151 and ENG 152 may not be used to fulfill this requirement.

Science and Mathematics (SR, SR-L, QL; 10–12 credits)
Three courses in at least two different discipline areas are required. The discipline areas are represented by the course prefix designators that precede the course number in the catalog (e.g., BIO, PHYS). Courses that fulfill the science distribution requirement are labelled SR – SEE-Certification: Scientific Reasoning or SR-L – SEE-Certification: Scientific Reasoning-Laboratory in the course descriptions. Courses that fulfill the math distribution requirement are labelled QL – SEE Certification: Quantitative Literacy in the course descriptions.
One course must be a laboratory science (SEE-Certification: Scientific Reasoning-Laboratory).
One course must carry the MATH designation and SEE-Certification: Quantitative Literacy label (excluding MATH 132 or MATH 201).

Social Sciences (SS; 6 credits)
Two courses in two different discipline areas are required. The discipline areas are represented by the course prefix designators that precede the course number in the catalog (e.g. GEO, SOC). Courses that fulfill the social science distribution requirement are labelled SS – SEE Certification: Social Sciences in the course descriptions.

Fine Arts (FA; 3 credits)
One course in the fine arts is required. Courses that fulfill the fine arts distribution requirement are labelled FE – SEE Certification: Fine Arts in the course descriptions.

3. *Identify any specialized accreditation or graduate certification requirements for the program and its students.*

   None

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

   NOT APPLICABLE

H. Adequacy of Articulation

If applicable, discuss how the program supports articulation with programs at partner institutions.

One of the design parameters for the curriculum in Cybersecurity and Digital Forensics is to offer a seamless transition from community college graduates to a bachelor's degree. Stevenson visited several neighboring community colleges. Community college programs in cybersecurity were reviewed, and common courses were found. These courses have been mapped to existing lower-division courses or new courses in the proposed program. Where it is not possible to identify a one-for-one match, community college courses can be accepted as general electives at Stevenson, thus satisfying some of their bachelor's degree requirements.

Once the students from the community colleges enroll in Stevenson's Cybersecurity and Digital Forensics program, there is also an opportunity for the students to enroll in Stevenson's BS-MS program. Enrollment in this program would allow these students to earn as many as 18 master's degree credits prior to completing their undergraduate degree. Stevenson offers several BS-to-MS degree options, where students with acceptable grade point averages can take up to six graduate credits with two counting towards their bachelor's degree. All graduate courses taken as an undergraduate will count towards students' master's degree requirements, which will accelerate their progress towards an advanced degree. This option would be open to students entering the traditional and online offerings of the Cybersecurity and Digital Forensics program. Among the master's degree programs that graduates would find attractive are the M.S. in Business and Technology Management, M.S. in Digital Forensics, M.S. in Forensic Investigation, or M.S. in Forensic Studies.

I. Adequacy of faculty resources (as outlined in COMAR 13B.02.03.11).

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

Both new and current faculty will teach in the proposed program. There are currently 9 full-time faculty who will teach in the proposed program. It is anticipated that 2 new faculty will be needed, one to be hired beginning in Year 3 and another to be hired beginning in Year 5.

In addition, a cadre of highly-credentialed adjunct faculty with real world, ongoing professional experience, will teach in the program. The adjunct faculty's expertise is based, in part, on the work they do in private organizations such as BlackRock; government organizations such as the Department of Defense and the Federal Bureau of Investigation; and University Affiliated Research Center (UARC) organizations such as the Johns Hopkins University Applied Physics Laboratory. Many already participate in the longstanding master's degree programs in Digital Forensics and Cyber Forensics.

During the implementation of the proposed degree program, the expectation is that full-time faculty, along with practicing professionals in the cybersecurity and digital forensics fields, will provide expertise as faculty. As enrollments grow, new faculty with credentials appropriate to the degree program will be hired. See the table below for a summary list of faculty currently employed by Stevenson University with appropriate credentials to teach in the proposed program.

Initially, Alan Carswell, PhD, Professor and Chair of the Department of Information Systems, Brown School of Business and Leadership and Steven Engorn, MBA, Program Coordinator and Assistant Professor, Stevenson University Online, will oversee the program jointly. Both have extensive experience in teaching and academic leadership in these fields. The University will seek to engage a full-time program coordinator specifically to lead the BS in Cybersecurity and Digital Forensics during the second year of operation as the number of students increases and the development of new courses and revision of existing courses accelerate.

Name	Academic Degree	Academic Title/Rank	Status	Courses
Alan Carswell	PhD	Professor and Department Chair	Full-time	CDF-110, CDF-290, IS-365, CDF-480
Steven Engorn	MBA	Program Coordinator, Assistant Professor	Full-time	CDF-290, IS-365, CDF-480
Jakie Brown	Masters of Theology	Assistant Professor	Full-time	IS-231, CDF-251,
Dean Cook	PhD	Professor	Full-time	CDF-391, CDF-392, CDF-393, CDF-475
Arthur Fifer	MBA	Assistant Professor	Full-time	IS-140, CDF-290

Name	Academic Degree	Academic Title/Rank	Status	Courses
Alan Foote	PhD	Associate Professor	Full-time	IS-240,
Shelley Pumphrey	MAS	Lecturer	Full-time	MGT 210
Sidas Saulynas	MS, Finance	Assistant Professor	Full-time	CDF-110, CDF-290, IS-365
Ken Snyder	Masters of Engineering Science	Assistant Professor	Full-time	CDF 240, IS-231, IS-235, IS-331, IS 432
Cary Barker	MS, Network Security	Adjunct Professor	Part-time	CDF-251, CDF-252, IS 432
Mary Bargteil	MFA	Adjunct Professor	Part-time	MGT 210
Thomas Byrd	JD	Program Coordinator, Cyberforensics	Part-time	CDF-271, CDF-290
Patrick Carroll	MS	Adjunct Instructor	Part-time	CDF-251, CDF-252, IS-231, IS-232, IS-331
James Gibson	MS, Applied Information Technology	Adjunct Professor	Part-time	IS-231
Dean Horvath	MS	Adjunct Professor	Part-time	MGT 210
Paul Insley	MS, Advanced Information Technology	Adjunct Instructor	Part-time	CDF-251, CDF-252, IS-231, IS-232, IS-235, IS-331
Algis Kemezys	MBA	Adjunct Instructor	Part-time	IS 140
Thomas Lentz	MS, Advanced Information Technology and MBA	Adjunct Professor	Part-time	CDF-110, CDF-480
Marc Levin	MS, Information Technology	Adjunct Professor	Part-time	IS 140
Adam Mattina	BS	Adjunct Instructor	Part-time	CDF-261, CDF-271, CDF-281
Ronald McGuire	MS	Adjunct Instructor	Part-time	CDF-261, CDF-271, CDF-281, CDF-391, CDF-392, CDF-393, CDF-475, IS 432
Jared Myers	MS	Adjunct Instructor	Part-time	CDF-475
David Patrick	MS	Adjunct Instructor	Part-time	IS-235, IS-240, CDF-240

Name	Academic Degree	Academic Title/Rank	Status	Courses
Jerome Palmerino, Jr.	MS, Information Systems	Adjunct Professor	Part-time	IS-240, CDF-240
Morris Pondfield	MIM, MS, Information Systems	Adjunct Professor	Part-time	IS 140
Keith Safford	MES	Adjunct Instructor	Part-time	IS-240
Jennifer Schneider	MS, Forensic Studies	Adjunct Instructor	Part-time	CDF-261, CDF-271, CDF-281
Sarena Schwartz	MS, Advanced Information Technology	Adjunct Professor	Part-time	CDF-110, IS-240
Ron Shaeffer	MS	Adjunct Instructor	Part-time	CDF-261, CDF-271, CDF-281, CDF-391, CDF-392, CDF-393, CDF-475, IS 432

J. Adequacy of library resources (as outlined in COMAR 13B.02.03.12).

Describe the library resources available and/or the measures to be taken to ensure resources are adequate to support the proposed program.

The Stevenson University Library maintains both physical and electronic collections to support programs of study at the University. The physical collections are located in the Learning Resource Center building on the Greenspring Campus and in the Brown School of Business and Leadership Library. The library resources are accessed through the Stevenson Library website at stevensonlibrary.org making collections easily available to traditional and online students.

In addition, the Library's website provides access to a range of electronic services including access to over 80 databases, a library FAQ, Interlibrary Loan, email and chat reference, tutorials, citation guides, and AskUsNow, a 24/7 reference service.

Further, the Stevenson Library participates in several area consortia to expand information sources available to students. Students have borrowing privileges through Stevenson's partnership with the Baltimore Area Library Consortium (BALC) and MICUA Consortia. The Library also participates in the BREILL courier service for interlibrary loan.

The library currently subscribes to the following online databases relevant to the proposed program:

Academic Search Complete – Scholarly and popular articles on a variety of subjects
ACM Digital Library – Largest collection of full-text writings on computing and information technology available
Business Source Complete – Scholarly journals, business magazines, trade publications, and full-text access to Harvard Business Journal
Criminal Justice Abstracts with Full Text – Covers over 625 journals and magazines in the field of criminal justice and related fields
eBook Academic Collection (Ebsco) – a collection of 141,500 eBooks on a range of academic subjects.
FORENSICnetBASE – Full text e-books in areas of forensics
LexisNexis Academic – Full text international coverage of news, business, and legal publications
ProQuest Ebook Central – full-text collection of approximately 70,000 electronic books. It is fully searchable and can also be browsed by subject discipline and by publisher
ScienceDirect College Edition – Scholarly full-text journals in forensic sciences and computer science and ebooks in forensics and criminal justice

Professional librarians are available to provide in-depth research support and work with faculty to create course-specific curricular materials like tutorials and course guides .

The library has been strongly supporting the digital forensics degrees for many years both on-site and online. Books, periodicals, electronic materials, and online databases in these disciplines have been regularly acquired and are rapidly replaced or updated as these fields develop. Given the excellent base of materials in the library's existing collection in this area, supporting the proposed program does not require additional resources.

K. Adequacy of physical facilities, infrastructure and instructional equipment (as outlined in COMAR 13B.02.03.13)

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.

The BSOBL maintains adequate classrooms, staff and faculty offices, and computers to facilitate student success in and completion of the program. Recently, BSOBL has set aside two computer labs/classrooms for the IS and CDF programs. Each lab/classroom is equipped with 28 workstations and an instructor's station, and the computers are configured to allow students to install and configure specialized software as part of their class activities. The rooms are secured with keycard access and only current IS students and faculty can unlock the doors.

SUO utilizes the Blackboard™ LMS hosted model and, thus, anticipates that increased student growth will not impact the ability of the University to provide exemplary courses to the students in this program.

Both programs will use the University's virtual environment known as vLab, which has as its foundation VMware's VSphere. In addition, software programs such as Encase and VMware licensed software are already in use in the University. Additional cybersecurity/digital forensics software for use by both the BSOBL and SUO programs and additional devices for the cybersecurity classroom in BSOBL are anticipated and included in the equipment costs for the program. Finally, all memory upgrades, additional network storage and any other hardware needs have been planned for and included in the equipment costs for the program.

L. Adequacy of financial resources with documentation (as outlined in COMAR 13B.02.03.14)

1. *Complete Table 1: Resources and Table 2: Expenditures. Finance data for the first five years of program implementation are to be entered. Figures should be presented for five years and then totaled by category for each year.*

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)	$101,250	$584,400	$1,569,420	$2,684,640	$3,982,320
a. Number of F/T Students (see table below)		10	33	61	93
b. Annual Tuition/Fee Rate		$35,490	$35,490	$35,490	$35,490
c. Total F/T Revenue (a x b)		$354,900	$1,171,170	$2,164,890	$3,300,570
d. Number of P/T Students	15	34	59	77	101
e. Credit Hour Rate	450	450	450	450	450
f. Annual Credit Hour Rate (11CRS OR FEWER)	15	15	15	15	15
g. Total P/T Revenue (d x e x f)	$101,250	$229,500	$398,250	$519,750	$681,750
3. Grants, Contracts & Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL REVENUE (Add 1 - 4)	**$101,250**	**$584,400**	**$1,569,420**	**$2,684,640**	**$3,982,320**

Table 2: Expenditures

	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b + c +e + f below)	$15,400	$23,100	$158,800	$166,490	$302,308
a. # Fulltime Faculty			1.0	1.0	2.0
b. Fulltime Total Salary		$	$100,000	$103,000	$206,100
c. Fulltime Total Benefits (28%)			$28,000	$28,840	$57,708
d. # Adjunct Faculty	4	6	8	9	10
e. Adjunct Total Salary	$14,000	$21,000	$28,000	$31,500	$35,000
f. Adjunct Total Benefits (10%)	$1,400	$2,100	$2,800	$3,150	$3,500
2. Admin. Staff (b + c below) (Full-time Program Coordinator)	-	$153,600	$158,208	$162,954	$167,842
a. # FTE	0	1	1	1	1
b. Total Salary	-	$120,000	$123,600	$127,308	$131,127
c. Total Benefits@.28%	-	$33,600	$34,608	$35,646	$36,715
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 (Computer hardware and software)	$24,100	$39,250	$58,000	$11,600	$166,081
5. Library	0	0	0	0	0
6. New or Renovated Space	0	0	0	0	0
7. Other Expenses (Course Developments)	$12,000	$1,000	$1,000	$2,000	$7,000
TOTAL EXPENDITURES (Add 1 - 7)	$51,500	$216,950	$376,008	$343,044	$643,231

2. *Provide a narrative rationale for each of the resource category. If resources have been or will be reallocated to support the proposed program, briefly discuss the sources of those funds.*

TABLE 1: RESOURCES

Reallocated Funds

Analyze the overall impact that the reallocation will have on the institution, particularly on existing programs and organizational units.

No reallocation of funds is planned as part of delivering this new academic program.

Tuition and Fee Revenue

Tuition makes up the revenue that will be generated for the support of the program. The enrollment projections are based upon the number of projected full-time students enrolled in the BSOBL program and part-time students enrolled in SUO. Full-time student tuition is projected at $35,490 for all years. Part-time student tuition is projected at $450 per credit for all years. The assumption in the tuition revenue projection is that full-time students will register for the full year and that part-time students will enroll for 15 credits over the course of one year.

Grants and Contracts

Provide detailed information on the sources of the funding. Attach copies of documentation supporting the funding. Also, describe alternative methods of continuing to finance the program after the outside funds cease to be available.

There are no resources from grants, contracts, or other external sources are designated for implementation of this program.

Other Sources

Provide detailed information on the sources of the funding, including supporting documentation.

No resources from other sources are necessary for the delivery of this new academic program.

Total Year
Additional explanation or comments as needed.

No additional explanations or comments are included.

TABLE 2: EXPENDITURES – NARRATIVE

Faculty

Both new and current faculty will teach in the proposed program. Several existing courses provide foundational knowledge in information technology, which is needed for the cybersecurity and digital forensics degree. There are currently 9 full-time faculty who will teach in the proposed program. It is anticipated that 2 new faculty will be needed, one to be hired beginning in Year 3 and another to be hired beginning in Year 5. Average annual salary for new full-time faculty teaching in this degree per FTE is $100,000, a cost set to ensure that the University can attract faculty to teach in this highly competitive field, and increased by 3% in subsequent years. Benefits were calculated at 28%.

Adjuncts who are experts in their respective fields will also be used to teach in the proposed program. It is anticipated that 4 sections will be taught by adjuncts in Year 1, 6 sections in Year 2, 8 sections in Year 3, 9 sections in Year 4, and 10 sections in Year 5. Adjunct faculty average $3500 per course. Benefits were calculated at 10%.

Administrative and Support Staff

Initially, the program will be overseen jointly by Alan Carswell, PhD, Professor and Chair of the Department of Information Systems, Brown School of Business and Leadership and Steven Engorn, MBA, Program Coordinator and Assistant Professor, Stevenson University Online. Both have extensive experience in teaching and academic leadership in these fields.

The University will seek to engage a full-time program coordinator (1 FTE) specifically to lead the BS in Cybersecurity and Digital Forensics during the second year of operation as the number of students increases and the development of new courses and revision of existing courses accelerate. Salary is suggested at $120,000, a salary competitive with salaries for persons working in the field and is increased by 3% in subsequent year. Benefits were calculated at 28%.

Additional support will be provided for the proposed program by current individuals in staff positions in BSOBL and SUO.

Equipment

There will be equipment expenses associated with the implementation of this new program. The additional equipment needed includes the following:

Year 1
Memory Upgrade for 5 blades at for vAcademy
VMware license costs
Cybersecurity/Digital Forensics Software

Year 2
Additional 20 TB Disk Drives for vAcademy
Increase Encase concurrent users
VMware license costs
Cybersecurity/Digital Forensics Software
Devices for Cybersecurity classroom, i.e. IOT devices

Year 3
VMware license costs
Replace 29 computers for Cybersecurity Lab
Cybersecurity/Digital Forensics Software

Year 4
VMware license costs
Cybersecurity/Digital Forensics Software

Year 5
Upgrade vLab Environment
Increase Encase concurrent users
VMware license costs
Cybersecurity/Digital Forensics Software

Library

No new library resources will be needed for this degree.

Other

Other expenses include course development and redevelopment costs. Course developers are compensated $1,000 for new developments and $500 for redevelopments. Initially, $12,000 will be needed during Year 1 to fully implement the program. These funds will be used for nine new and six revised courses. Years 2 and 3 will required two revisions of existing courses; Year 4 will require 4 revisions of courses previously developed in Year 1 due to changes in technology; Year 5 will require revision of 5 new courses from year 1 and as revision of 3 revised courses from Year 1; and 3 new courses will be added.

M. Adequacy of provisions for evaluation of program (as outlined in COMAR 13B.02.03.15).

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

Programs at Stevenson are reviewed according to an established program review cycle and revised, as appropriate, to reflect the mission and vision of the University and the needs of the marketplace. The approval process for new courses requires a matrix that demonstrates alignment of course objectives with program objectives. The matrix becomes a course map, the purpose of which is to demonstrate alignment of each assignment in the course to both course objectives and program objectives. The alignment matrix and course maps are essential tools in assessing the effectiveness of the program. All programs contain a capstone experience that enables the program to observe and evaluate students' capabilities across multiple skill areas. Each program is also required to engage in a program review process every five years.

Courses are routinely monitored by program coordinators/department chairs/associate deans to ensure that best online teaching practices are being maintained by faculty including: (1) frequent faculty-to-student and student-to-student interaction; (2) prompt feedback; (3) clear expectations for completing assignments and other activities; and (4) opportunities for active learning among students. Stevenson utilizes the Quality Matters Standards rubric as a guideline for all online courses. Faculty presence in each course is monitored. Courses are managed by a course

manager and instructional designer with expertise in online course development to ensure that the courses include a sequence of learning activities that students can easily navigate and a communication strategy is in place for the unexpected. Academic program coordinators/ department chairs/associate deans and instructional designers ensure there is continued alignment between assignments and course objectives and faculty communicate high expectations for student performance. Finally, faculty are able to avail themselves of ongoing assistance in the performance of their responsibilities through access to the technical and academic assistance provided by the instructional design staff and academic program coordinators/department chairs/associate deans.

Assessment and documentation of student achievement of learning outcomes occurs throughout the distance education programs. Each course syllabus clearly identifies the desired learning outcomes for students. Assignments are designed so that all course outcomes are assessed, and each graded assignment is scored often using a rubric to determine if the student has demonstrated proficiency with the related outcome. Student portfolios demonstrate student mastery of outcomes across all courses in the program and are assessed using a standards-aligned rubric during the capstone course of the program.

Student course evaluations are routinely administered at the end of each session and are analyzed. Alumni are surveyed periodically to ascertain their opinions about whether they had attained the skills and knowledge required for their jobs and to provide their judgment about the strengths and areas for improvement in their program.

Faculty adhere to Quality Matters standards and to principles of best practice which include the following: (1) providing clear guidelines for student-to-student and student-to-faculty interaction; (2) creating well designed discussion assignments that facilitate meaningful dialogue among students; (3) developing student assessments which include project-based assignments to facilitate critical thinking in addition to tests and quizzes; (4) providing timely feedback; (5) providing regularly distributed deadlines to encourage course/program completion; (6) communicating high expectations; and (7) facilitating student participation in the selection of project and paper topics. Courses regularly are reviewed to ensure that they are meeting these standards.

N. Consistency with the State's minority student achievement goals (as outlined in COMAR 13B.02.03.05 and in the State Plan for Postsecondary Education).

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

The Stevenson University student population includes the largest number of diverse students among the private colleges and universities in Maryland. Each year approximately one-third of the entering class of first-year students qualify for federal Pell grants and are from 'educationally disadvantaged backgrounds'. In the 2015-2016 academic year, 45% of the total undergraduate population and 43% of the graduate and undergraduate part-time student population represented

minority groups. The percentage of under-represented minority students in the school's graduate programs has remained consistently above 40% since 2011 (IPEDS data for Stevenson graduate programs). The diverse student population is the result of an institutional plan to recruit students from diverse backgrounds by reserving a significant percentage of institutional grants for students with need as opposed to other determinates, such as educational attainment as measured by high school grades and admissions tests.

Stevenson University has made a commitment to attracting transfer students that has increased the diversity of the student population. Specifically, one-third of the new students during each of the last two years were transfer students predominantly from the state's community colleges where the lower tuition generally attracts the most disadvantaged students. The recruitment plan of the Office of Admissions has pushed outward geographically from the historic dominance of central Maryland counties, adding another factor that accounts for the increasing diversity of the student body.

Stevenson University has among its guiding documents a diversity statement that along with its mission, vision, and values comprise the guiding principles behind all policies of the institution. In order to ensure compliance with the commitment to diversity, Stevenson University has an office of multicultural affairs that serves as a key component of its student services unit. This office is responsible for the annual diversity update submitted for publication to the Maryland Independent College & University Association (MICUA).

In December 2016, SUO held its annual Forensic Symposium that focused on diversity and inclusion attended by both current graduate students and alumni of the programs. According to Nelson Santos of the Drug Enforcement Agency, one of several speakers, forensics used to be a male-dominated profession; however, in recent years, organizations have begun to embrace and support diversity in the workplace. All speakers agreed the proper avenue to address these challenges is through education. Through education and training, employees have the greatest potential to understand that diversity and inclusion practices enhance the performance of an organization. Speakers concluded that diversity in the forensics workplace cannot be forced - it requires education.

Goal 3 of the 2013-2017 Maryland State Plan for Postsecondary Education in to "Ensure equal opportunity for Maryland's diverse citizenry." The proposed program is consistent with and promotes this plan and the School's commitment to inclusion and diversity among its student, faculty and staff.

O. Relationship to low productivity programs identified by the Commission:

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 section is not applicable to independent institutions

P. If proposing a distance education program, please provide evidence of the Principles of Good Practice (as outlined in COMAR 13B.02.03.22C).

Curriculum and Instruction:

1. *A distance education program shall be established and overseen by qualified faculty.*

The proposed program will be offered in a fully online format by SUO. Stevenson University distance education programs are developed and overseen by faculty members specifically selected for their subject matter expertise as well as their ability to teach in the online environment. All faculty members hired to teach in the online environment must participate in a faculty in-take session. During the in-take session, faculty are assessed for appropriate teaching skills and ability to interact effectively with students in the online environment through a series of Blackboard learning management system activities that include the following: (1) grading student papers; (2) responding to student discussion forums; and (3) creating an online presentation using media. Faculty are also required to participate in a subsequent online development course that includes facilitating adult learning, developing course management techniques, using grading rubrics, avoiding and recognizing plagiarism and cheating, among other topics. Only faculty who successfully complete these activities are selected to teach and develop distance education courses.

2. *The program's curriculum shall be coherent, cohesive, and comparable in academic rigor to programs offered in traditional instructional formats.*

All courses in the distance education program are subject to the same design and approval process as those offered in traditional instructional formats. All courses, whether in a distance education or traditional format, are initially proposed by the academic departments. The courses are reviewed first by the academic program coordinator/department chair/associate dean and then by the dean of the school which oversees the academic department. The courses are then reviewed by the school's representative to the Academic Affairs Committee (AAC) subcommittee of the University's Faculty Council, as well as by an AAC non-school representative; a representative from the Office of Institutional Research and Assessment; and a University librarian to ensure that the appropriate materials are available to the students. Courses are then submitted for review and approval by the Deans' Council, which is comprised of the deans from all seven schools in the University. Finally, the courses are submitted for review and approval by the AAC. The course content and student learning outcomes are identical regardless of whether a course is offered in a traditional format or a distance learning format. This thorough review process ensures the curriculum for distance education programs is coherent, cohesive and comparable in academic rigor to programs offered in traditional instructional formats.

3. *The program shall result in learning outcomes appropriate to the rigor and breadth of the program.*

All program proposals are reviewed to ensure that the appropriate levels of the Bloom/Krathwohl taxonomies are addressed in each course in the program and for the program as a whole. All course level and program level requirements meet the standards set by the University for undergraduate courses and programs. All courses include learning outcomes appropriate for the course level. Programs and courses are reviewed and assessed routinely to ensure that the outcomes are being met by the students.

4. *A program shall provide for appropriate real-time or delayed interaction between faculty and students.*

All courses in the distance education program provide appropriate student-to-faculty and student-to-student interaction. This interaction is generally asynchronous using discussion board forums, wikis, blogs, journals or interactive software. Faculty are required to provide feedback to students using these modalities. Synchronous, real-time interaction is available through the use of a variety of web appropriate methods, such as VoiceThread, BlueJeans, Google Hangouts, or Skype. Faculty use these or other synchronous methods for assuring large group or individual interaction is a planned part of each course as appropriate.

5. *Faculty members in appropriate disciplines in collaboration with other institutional personnel shall participate in the design of courses offered through a distance education program.*

Stevenson University Online has three full-time instructional designers, an Associate Dean for Distance Learning, and graduate assistants as part of its educational design and technology team. The team has considerable experience and expertise on the BlackBoard™ course management system used to deliver distance education courses, and works with all those who have technology needs—the administrators, faculty, and students. The team also provides instructional design support to all faculty members developing and teaching distance education courses. Members of the instructional design team have received appropriate training and certifications. One of the instructional designers has received her Quality Matters Peer Review certification and her Quality Matters Institutional Review certification. The other instructional designers have Quality Matters Peer Review certification.

All faculty work with an identified instructional designer during the entire design of courses offered through a distance education program. This collaboration continues during the instruction phase of course delivery. All courses are reviewed by the program coordinator/department chair/associate dean in collaboration with the faculty and instructional designer. All distance education courses must be approved by the program coordinator chair/department chair/associate dean prior to being offered to students.

Role and Mission:

1. *The program shall be consistent with the institution's mission.*

Stevenson University's mission is to provide a distinctive career-focused education and personalized environment for its students. The cornerstone of the mission is an educational experience that supports career planning while encompassing liberal arts, science, and technology. The University meets students where they are and supports and challenges them to become reflective and accomplished individuals committed to a lifetime of learning and contribution. Students graduate with the competence and confidence needed to address creatively the opportunities and problems facing their communities, the nation, and the world. The proposed program fulfills the University's mission.

2. *Review and approval processes shall ensure the appropriateness of the technology being used to meet a program's objectives.*

All course and program objectives are reviewed and approved by the Academic Affairs Committee. Once the program and course objectives have been approved, the technology that will best facilitate student attainment of the objectives is selected by the faculty and instructional designer collaboratively. The instructional design staff are well trained to ensure that appropriate technology or tools are selected.

Faculty Support:

1. *An institution shall provide for training for faculty with the use of technology, including training in the learning management system and the pedagogy of distance education.*

All faculty have access to the training opportunities routinely provided by the instructional design staff of SUO. The schedule for faculty professional development includes training in the use of available technologies for enhancing online and face-to-face instruction and use of Blackboard at both a beginner and advanced level. Individual appointments with instructions design staff are also encouraged. The SUO instructional design team offers professional development seminars for faculty related to andragogy and the best practices for teaching adult students and SUO maintains a faculty professional development website for faculty to access webinars and virtual trainings asynchronously. Once a semester, faculty meetings are held using a virtual meeting software BlueJeans and recordings of the meetings are posted and made available for faculty. Additionally, the instructional design team maintains a faculty resources website with links to webinars and other resources related to instructional methods and technology and best practices for using the LMS.

2. *Principles of best practice for teaching shall be developed and maintained by the faculty.*

Faculty adhere to Quality Matters standards and to principles of best practice which include the following: (1) providing clear guidelines for student-to-student and student-to-faculty interaction; (2) creating well designed discussion assignments that facilitate meaningful dialogue among students; (3) developing student assessments which include project-based assignments to facilitate critical thinking in addition to tests and quizzes; (4) providing timely feedback; (5) providing regularly distributed deadlines to encourage course/program completion; (6)

communicating high expectations; and (7) facilitating student participation in selection of project and paper topics. Courses are regularly reviewed to ensure that they are meeting these standards.

3. *An institution shall provide faculty support services specifically related to teaching in a distance education format.*

Faculty are provided support specifically related to teaching in a distance education format throughout their entire time of teaching for Stevenson University. As noted above, prior to teaching a distance education course, faculty are required to participate in an online faculty development course. In addition, faculty attend twice annual meetings which are held virtually to accommodate faculty who live out-of-state or are otherwise unable to come to campus.

Continuing professional development workshops from a variety of local and national organizations are made available to the faculty to improve their teaching effectiveness in an online environment. Sessions are a mix of synchronous and asynchronous and are made available on the SUO Faculty Development site and on the Faculty Resources site in Blackboard. Workshop topics have included the following: (1) Introduction to Blackboard; (2) Advanced Blackboard Training; (3) Use of the Grade Center; (4) Facilitating Discussion Boards; (5) How Interaction Aids Learning; (6) Developing Accelerated Online Courses; (7) Best Practices in Accelerating Courses; (8) Available Technologies to Facilitate Online Learning; (9) Teaching a Course You Did Not Develop; and (10) Working with Master Courses. Each workshop is evaluated.

Appropriate learning resources shall be available to students, including appropriate and adequate library services and resources.

Students and Student Services:

1. *A distance education program shall 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, financial aid resources, and costs and payment policies.*

Students receive information about curriculum, course and degree requirements from both admissions personnel and the student support coordinator assigned to the degree program. WebXpress is the online system that allows Stevenson University applicants, students, and faculty to access multiple online resources. With WebXpress, prospective students can check on the status of their application. Current students have access to class schedules, status of accounts, grades, degree audit forms and registration. Faculty can monitor rosters and post grades.

Technical equipment requirements are made known to students through information provided to them during the admissions process and again at orientation. A special browser checker is available to help students assess that their computer is up-to-date and appropriately equipped.

Each course syllabus also outlines technical requirements for taking the online course and also indicates any additional software or hardware that may be necessary for successful student performance.

Student support is provided for BlackBoard, the University's learning management system. Tech Connection, the University's technology support group, provides technical support to students experiencing difficulties with computer related issues. Faculty and instructional design staff assist students with academic issues related to online courses.

The Stevenson University website offers a convenient way to find information related to the University, including financial aid, costs and payment policies, and federally required complaint policies. The website includes links to various units and to academic support services. Website revisions are ongoing in an attempt to remain current, and the Stevenson portal (intranet) provides enrolled students and faculty ways to improve communications and information sharing. There is a student support page associated with the University's SUO webpage that houses links to academic and student support services specific to the needs of online adult learners.

SUO uses a Student Success Coach model to expand the faculty advising capacity. Student success coaches are assigned to a degree program and thus have intimate knowledge of each of the programs in which a student is enrolled. They are able, therefore, to offer timely advice about programs and course schedules and to assist students when they are having difficulties with online learning unrelated to the academic programs themselves.

2. *Enrolled students shall have reasonable and adequate access to the range of student services to support their distance education activities.*

Library Facilities

The Stevenson University Library maintains both physical and electronic collections to support programs of study at the University. The physical collections are located in the Learning Resource Center building on the Greenspring Campus and in the Brown School of Business and Leadership Library. The library resources are accessed through the SU Library website at stevensonlibrary.org making collections easily available to traditional and online students.

In addition, the Library's website provides access to a range of electronic services including access to over 80 databases, a library FAQ, Interlibrary Loan, email and chat reference, tutorials, citation guides, and AskUsNow, a 24/7 reference service.

Further, the SU Library participates in several area consortia to expand information sources available to students. Students have borrowing privileges through SU's partnership with the Baltimore Area Library Consortium (BALC) and MICUA Consortia. The Library also participates in the BREILL courier service for interlibrary loan.

The library currently subscribes to the following online databases relevant to the proposed program:

Academic Search Complete – Scholarly and popular articles on a variety of subjects
ACM Digital Library – Largest collection of full-text writings on computing and information technology available
Business Source Complete – Scholarly journals, business magazines, trade publications, and full-text access to Harvard Business Journal
Criminal Justice Abstracts with Full Text – Covers over 625 journals and magazines in the field of criminal justice and related fields
eBook Academic Collection (Ebsco) – a collection of 141,500 eBooks on a range of academic subjects.
FORENSICnetBASE – Full text e-books in areas of forensics
LexisNexis Academic – Full text international coverage of news, business, and legal publications
ProQuest Ebook Central – full-text collection of approximately 70,000 electronic books. It is fully searchable and can also be browsed by subject discipline and by publisher
ScienceDirect College Edition – Scholarly full-text journals in forensic sciences and computer science and ebooks in forensics and criminal justice

Professional librarians are available to provide in-depth research support and work with faculty to create course-specific curricular materials like tutorials and course guides.
The library has been strongly supporting the digital forensics degrees for many years, both on-site and online. Books, periodicals, electronic materials, and online databases in these disciplines have been regularly acquired and are rapidly replaced or updated as these fields develop. Given the excellent base of materials in the library's existing collection in this area, supporting the proposed program does not require additional resources.

Admissions

Students are provided recruitment and admission information through various means. Admissions information is available on the Stevenson University SUO website. Information sessions are held through the year both face-to-face and online. Finally, an enrollment counselor specifically assigned to the program facilitates face-to-face meetings and is available to communicate with students via telephone or email. Students are able to complete either an online or paper application. The Transcript Evaluator for SUO provides services such as transcript and credit evaluations using ARTSYS.

Financial Aid/Student Accounts

Scholarships, grants, and loans are available to students. Financial aid information is provided to prospective students throughout the admissions process. To apply, students must complete the Free Application for Federal Student Aid (FAFSA). Student-specific information relating to financial aid awards is available through WebXpress. General information relating to financial aid is available on the website.

Students have the ability to view and print their bills online through WebXpress. Information regarding payment and refund policies are on the University's website and are provided to students in their orientation packets. Students are able to make payments online through WebXpress, by telephone or through the mail by means of check, money order or credit card. Students have access through the website or by telephone to the University's Student Solution Center, a financial aid/student accounts advisory office, to answer questions and solve problems.

Registration

Students register for classes online through WebXpress. A student success coach is available by telephone, email or in person to help students with registration.

Orientation

Accepted students are sent an orientation packet through the mail. In addition, an orientation session both face-to-face and online is held at the beginning of each session for all new students. All new entering online students are required to complete GPS 100, an online orientation course using the university's LMS, Blackboard™. This course introduces students to Stevenson University Online, student expectations, information regarding the university's academic integrity policies, and related information.

Advising

Each student is assigned to a student success coach who monitors degree or certificate completion progress and retention. Academic advising is in person, by telephone or online. Online advising occurs through the University's email system. The University has obtained the necessary modules to implement E-Advising through its Colleague System, a component of Datatel. Once fully implemented, this system will be used for online advising.

Access to Academic Services

Stevenson is organized to connect students to the resources they need to succeed. Admissions practices seek to recruit, admit, and enroll students whose interests and abilities are congruent with the University's mission and diversity statements. Student support services aim to develop students' strengths and meet their current and developing needs. These areas share the goals of retaining students in the Stevenson community while preparing them for future careers.

Online tutoring is accessible through SMARTHINKING Online tutoring services are available to students through a variety of means including one-on-one live online tutoring sessions, drop-in tutoring sessions, scheduled tutoring sessions, or through submission of writing assignments for feedback. Students can access these online tutoring activities from any computer facilities available to them.

The University focusses on professional preparation and all students are also provided career services such as resume critiques, job search assistance, mock interviews, career assessment

tools, career counseling, and graduate or professional school preparation. Career workshops are regularly held for students, both on-site and online. A dedicated industry specialist is available to assist students in distance education programs. Career counseling is available to students both in-person and via the web using interactive collaborative software. This mission has consistently achieved noteworthy success, with at least 92 percent of Stevenson's graduates every year in the past five years securing employment or continuing their education within six months of graduation. All these services are available to students in the distance education program.

3. *Accepted students shall have the background, knowledge, and technical skills needed to undertake a distance education program.*

All programs adhere to specific admissions requirements in order to ensure that accepted students have the background and knowledge needed to undertake and be successful in a distance education program. In addition, all accepted students are required to take part in online orientation using the Blackboard learning management system designed to introduce them to Stevenson University and the use of the Blackboard.

4. *Advertising, recruiting, and admissions materials clearly and accurately represent the program and services available.*

All electronic and print advertising, recruiting, and admissions materials clearly and accurately represent the program and services available. The admissions and recruitment staff are all extremely knowledgeable about the programs. All materials are reviewed by program coordinator/department chair/associate dean and the school dean before dissemination and list clearly the program, admissions requirements and contact information.

Commitment to Support

1. *Policies for faculty shall include appropriate consideration of teaching and scholarly activities related to distance education programs.*

Faculty evaluation policies do not distinguish between teaching in a distance education program and in a traditional program. All faculty are evaluated based on the following criteria: (1) teaching effectiveness; (2) scholarship; and (3) service.

All courses are evaluated regardless of modality. Faculty are expected to reflect on the feedback received, using the *Faculty Response to Evaluation* form, which is submitted to the appropriate program coordinator. However, the evaluation instruments have been modified to take into account the differences in delivery methods.

Recently, SUO has undertaken a pilot of an online teaching evaluation, working with faculty and program coordinators to assure that evaluation goes beyond the usual end of course student evaluation. This evaluation tool will be implemented beginning Fall 2018 in full.

2. *An institution shall demonstrate commitment to ongoing support, both financial and technical, and to a continuation of a program for a period sufficient to enable students to complete the degree or certificate.*

Stevenson University is committed to its online programs. Both financial and technical support has been continually provided since 2006 when the University offered its first distance education program. The level of support has steadily increased over the years. The University fully funds the Blackboard™ servers and routinely upgrades its programs and services in support of the online programs. The University will be moving to a SASS hosted model during 2017-2018. A dedicated Blackboard™ IT technician is identified and the instructional design team expanded its staff and scope of operation over the last three years. Student success coaches, advisers, and other staff members assist in re-enrollment and retention services to enable students to complete their program.

Evaluation and Assessment:

1. *An institution shall evaluate a program's educational effectiveness, including assessments of student learning outcomes, student retention, student and faculty satisfaction, and cost-effectiveness.*

Programs at Stevenson are reviewed according to an established program review cycle and revised, as appropriate, to reflect the mission and vision of the University and the needs of the marketplace. The approval process for new courses requires a matrix which demonstrates alignment of course objectives with program objectives. The matrix becomes a course map, the purpose of which is to demonstrate alignment of each assignment in the course to both course objectives and program objectives. The alignment matrix and course maps are essential tools in assessing the effectiveness of the program. All programs contain a capstone experience that enables the program to observe and evaluate students' capabilities across multiple skill areas. Each program is also required to engage in a program review process every five years.

The student success coaches and other members of the student success team focus on student retention. Each new student in a distance education program receives a telephone call from a member of the team during each of their first three courses at Stevenson. The purpose of this call is to ensure students are satisfied with their experience at Stevenson and are not experiencing any difficulties in successfully completing their coursework. Data have shown that students who successfully complete their first three courses are likely to complete their degree program. Thereafter, the student success coaches are available to assist students with any questions or concerns. In addition, as part of the retention efforts, the student success coaches follow up with students who have not registered for subsequent sessions.

2. *An institution shall demonstrate an evidence-based approach to best online teaching practices.*

Courses are routinely monitored by program coordinators/department chairs/associate deans to ensure that best online teaching practices are being maintained by faculty including: (1) frequent

faculty-to-student and student-to-student interaction; (2) prompt feedback; (3) clear expectations for completing assignments and other activities; and (4) opportunities for active learning among students. Stevenson utilizes the Quality Matters Standards rubric as a guideline for all online courses. Faculty presence in each course is monitored. Courses are managed by a course manager and instructional designer with expertise in online course development to ensure that the courses include a sequence of learning activities that students can easily navigate and a communication strategy is in place for the unexpected. Academic program coordinators/ department chairs/associate deans and instructional designers ensure there is continued alignment between assignments and course objectives and faculty communicate high expectations for student performance. Finally, faculty are able to avail themselves of ongoing assistance in the performance of their responsibilities through access to the technical and academic assistance provided by the instructional design staff and academic program coordinators/department chairs/associate deans.

3. *An institution shall provide for assessment and documentation of student achievement of learning outcomes in a distance education program.*

Assessment and documentation of student achievement of learning outcomes occurs throughout the distance education programs. Each course syllabus clearly identifies the desired learning outcomes for candidates. Assignments are designed so that all course outcomes are assessed, and each graded assignment is scored using a rubric to determine if student has demonstrated proficiency with the related outcome. Student portfolios demonstrate student mastery of outcomes across all courses in the program and is assessed using a standards-aligned rubric during the capstone course of the program.

Student course evaluations are routinely administered at the end of each session and are analyzed. Alumni are surveyed periodically to ascertain their opinions about whether they had attained the skills and knowledge required for their jobs and to provide their judgment about the strengths and areas for improvement in their programs. The feedback from these assessments are used by faculty and program coordinators/department chairs/associate deans to review and redesign programs to better meet the needs of the students.