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NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s):   Harris-Stowe State University

Program Title: MS, Cybersecurity Management

Degree/Certificate: Master of Science/Certificate

Options: None

Delivery Site(s):   Main Campus of Harris-Stowe Satte University

CIP Classification: CIP

*CIP code can be cross-referenced with programs offered in your region on MDHE's program inventory highered.mo.gov/ProgramInventory/search.jsp
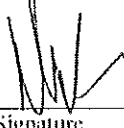
Implementation Date: Fall 2017

Cooperative Partners: None

*If this is a collaborative program, form CL must be included with this proposal

AUTHORIZATION:

Dr. Dwyane Smith, Provost		1/14/14
Name/Title of Institutional Officer	Signature	Date

Dr. Fara Zakery	314-340-5096
Person to Contact for More Information	Telephone

STUDENT ENROLLMENT PROJECTIONS

Year	1	2	3	4	5
Full Time	5	10	10	15	20
Part Time	5	5	10	10	10
Total	10	15	20	25	30

Please provide a rationale regarding how student enrollment projections were calculated:

Student enrollment projections are calculated based on national and regional market demand and unmet needs to fill the gap for unfilled professional positions in the field of cybersecurity management.

Provide a rationale for proposing this program, including evidence of market demand and societal need supported by research:

The major rationale for creating a M.S. degree in Cybersecurity Management is to better serve the demand of those students who are seeking a career and a graduate degree in the field of information security and assurance, and to meet the market demand for the above work force talent. There is a great need and demand for professionals with expertise in securing information and systems in industrial and governmental organizations.

Market Demand

The demand for highly skilled cybersecurity professions is growing continuously. According to the US Bureau of Labor Statistics- Occupational Outlook Handbook, 2012-22, the employment of Information Security Analyst jobs is projected to grow 37 percent from 2012 to 2022, much faster than the average for all other occupations. Demand for information security analysts is expected to be very high as these analysts will be needed to plan and utilize innovative solutions to prevent hackers from obtaining individual personal or business critical information or creating havoc on computer networks. Information Security Analyst jobs are listed among the top 20 fastest growing professions, with 75,000 jobs in 2012, and 37% growth by 2022.

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Form SE - Student Enrollment Projections

By any measure, the M.S. degree in Cybersecurity Management is similar to other business related degrees since there is no one career path attached to the degree. Recent Cybersecurity Management graduates entering the workforce would do well to broaden their job search as a cross between management, computer technology, finance, accounting and business degree program. Cybersecurity Management majors also can pursue many specialized certifications that will be in much higher demand.

The Cybersecurity Management career is focused on planning and carrying out security measures to protect organizations' computer networks and systems and Cybersecurity Management responsibilities are continually expanding as the number of cyberattacks increase (Occupational Outlook Handbook, 2012-22).

Among the careers available to Cybersecurity Management graduates are: Computer and Information Research Scientist, Computer and Information Research Manager, Computer Network Architect, Computer Programmer, Computer Systems Analyst, Database Administrator, Software Developer, Web Developer and Network and Computer Systems Administrator. Those seeking a career in Cybersecurity Management also have a variety of options available to them. There are a number of information security certifications available and many employers prefer job candidates to have one. Some are general information security certificates, such as the Certified Information Systems Security Professional, while others have a narrow focus, such as penetration testing or systems auditing. A Master of Science in Cybersecurity Management will confer a higher level of recognition and move the school's business programs closer to other accredited business schools.

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Fastest Growing Occupations

Fastest growing occupations: 20 occupations with the highest percent change of employment between 2012-22.

Click on an occupation name to see the full occupational profile.

OCCUPATION	GROWTH RATE, 2012-22	2012 MEDIAN PAY
Industrial-organizational psychologists	53%	$83,580 per year
Personal care aides	49%	$19,910 per year
Home health aides	48%	$20,820 per year
Insulation workers, mechanical	47%	$39,170 per year
Interpreters and translators	46%	$45,430 per year
Diagnostic medical sonographers	46%	$65,860 per year
Helpers—brickmasons, blockmasons, stonemasons, and tile and marble setters	43%	$28,220 per year
Occupational therapy assistants	43%	$53,240 per year
Genetic counselors	41%	$56,800 per year
Physical therapist assistants	41%	$52,160 per year
Physical therapist aides	40%	$23,880 per year
Skincare specialists	40%	$28,640 per year
Physician assistants	38%	$90,930 per year
Segmental pavers	38%	$33,720 per year
Helpers—electricians	37%	$27,670 per year
Information security analysts	37%	$86,170 per year
Occupational therapists	29%	$75,400 per year
Diagnostic medical sonographers, etc.	27%	$91,190 per year

As depicted in Table 1 and Fig. 2 below, Science, Technology, Engineering, and Math (STEM) fields continue to have strong need for diversity that should be addressed in the area of minority employment in the growing Information technology cybersecurity field. As the field of information technology and cybersecurity grows there is an unmet diversity need that should be addressed in the area of minority employment in the field. A diversified workforce brings innovation and divergent ideas to the workplace. According to the National Science Foundation (NSF) (Women, Minorities and Persons with Disabilities in Science and Engineering, Arlington, VA, NSF 13-304, February 2013), women constitute 28% of the Science and Engineering Workforce.

In addition, according to a 2004 report by the Information Technology Association of America (ITAA) trade group, the percentage of women in the IT workforce declined from 25.6% in 1996 to 24.9% in 2004.

Table 1: Scientists and engineers working in science and engineering occupations: 2010

Race/ethnicity and sex	Number	Percent
Total All Men	3,911,000	72%
Total All Women	1,488,000	28%
Black Men	139,000	3%
Black Women	108,000	2%
Total All Men and Women	5,399,000	

Source: https://niccs.us-cert.gov/home/women-minorities Downloaded 11/5/2015

Scientists and engineers working in science
and engineering occupations: 2010
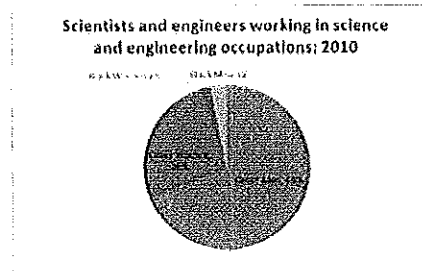
Figure 2: Scientists and engineers working in science and engineering occupations: 2010

There are a number of reasons that may have contributed to the lack of women in the IT workforce, including a lack of educational focus on and interest in STEM fields that equip young women with the expertise necessary for a career in IT and cybersecurity.

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Form St: - Student Enrollment Projections

Race/ethnicity and sex ⇕	Number ⇕	Percent ⇕
White men	2,776,000	51.0
White women	996,000	18.0
Asian men	726,000	13.0
Asian women	271,000	5.0
Black men	139,000	3.0
Black women	108,000	2.0
Hispanic men	198,000	4.0
Hispanic women	84,000	2.0
Other men	72,000	1.0
Other women	29,000	1.0
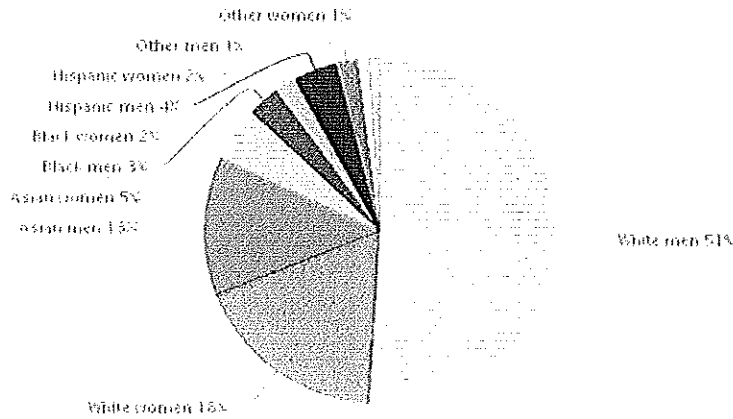
According to Eric Chabrow, Executive Editor of GovInfoSecurity & InfoRiskToday, and former
top editor at the award-wining business journal CIO Insight and a long-time editor and writer at

Form SE - Student Enrollment Projections

Information Week, the scarcity of women and minorities in the IT security field does not mirror the rest of the American workforce (Bank Information Security, BIT Sight, October 11, 2011). Chabrow (2011) stated that "Despite virtually no unemployment among IT security pros, the scarcity of women, African Americans, and Latinos is highly evident." The IT security profession in the United States is heavily white with a disproportionate number of Asians, as compared with the overall STEM workforce, according to an Information Security Media Group analysis of Labor Department employment figures. Labor Department figures also show for the third straight quarter, no unemployment exists among information security analysts, an occupation category that includes a number of IT security roles.

Student Demand

Over 60% of students graduating from Information Sciences and Computer Technology and other business programs continue their education onto a graduate degree. Many of these students inquire about a graduate program in information security and related field. Offering a graduate level program in cybersecurity management would provide an opportunity for students from school of business and mathematics department to pursue a specialized graduate degree in cybersecurity management.

DUPLICATION AND COLLABORATION

There are two HBCUs (Historically Black Colleges and Universities) in the State of Missouri, Harris-Stowe State University and Lincoln University. Currently, Lincoln University does not offer a graduate degree program in Information Systems and Security Management, leaving Harris-Stowe State University as the only HBCU catering affordable, accessible and quality educational program to an underrepresented population. Currently, besides Harris-Stowe, there is only one more public, urban institution in the city of St. Louis, the University of Missouri-St. Louis, which offers a certificate program in cybersecurity. Harris-Stowe State University is surrounded by several private universities. However, the cost of education of these universities is among the highest in Missouri and the nation.

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Local Competitive Universities

University	Degree Program
Harris-Stowe State University (HSSU)	**M.S. Degree in Cybersecurity Management**
University of Missouri St. Louis (UMSL)	NO Master degree in Cybersecurity
Washington University in St. Louis	M.S. Degree in Cybersecurity Management (No required core courses) Elective Driven
Saint Louis University (SLU)	NO Master degree in Cybersecurity
Maryville University	NO Master degree in Cybersecurity

The proposed M.S. degree in Cybersecurity Management at Harris-Stowe State University will provide access to a graduate science degree for the residents of the urban community who aspire to enter the field of information security and assurance and are unable to pursue it at another institution of higher education.

References

1. Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2014-15 Edition, Information Security Analysts, on the Internet at http://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm

2. The Comprehensive National Cybersecurity Initiative. Available online at: http://www.whitehouse.gov/issues/foreign-policy/cybersecurit/nationalinitiative

3. https://nices.us-cert.gov/home/women-minorities Downloaded 11/5/2015

4. http://www.careeinfonet.org/oview1 asp?next=oview&level=edu3optstatus=jobfam=&id=1&3&stfips=ShowAll

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5. http://www.bankinfosecurity.com/top-9-security-threats-2011-a-3228/op-1, Top nine Security Threats of 2011.

6. https://www.google.com/#q=eric+chabrow+Bank+Information+Security%2C+BIT+Sight%2C+October+11%2C+2011).+Chabrow+(2011).

7. National Science Foundation (NSF) (Women, Minorities and Persons with Disabilities in Science and Engineering, Arlington, VA, NSF 13-304, February 2013), http://www.nsf.gov/statistics/wmpd/2013/digest/

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PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

Institution Name   Harris-Stowe State University
Program Name   Master of Science/Certificate in Cybersecurity Management
Date   01-04-2016

(Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.)

1. Student Preparation

- Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.
Admission Requirements:
1. A student must have an undergraduate degree in Information Sciences and Computer Technology program or closely related discipline. Applicants who have a degree in a non-related fields will also be considered for admission provided they have completed prerequisite courses for admission to the graduate program.
2. Student must have a minimum undergraduate Grade Point Average (GPA) of 3.0 or better.
3. Applicant must complete the graduate Record Examination (GRE) with a minimum composite score of 900 (Verbal score of 150 or better; Quantitative score of 150 or better; Analytical score of 600 or better). For international students, the program requires a
    TOFEL, computer-based score of 223 and paper-based score of 530 or better.

- Characteristics of a specific population to be served, if applicable. N/A

2. Faculty Characteristics
- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.
Ph.D./Dr.Sci./DBA in Information Sciences or closely related discipline to be employed as a full-time faculty, and a minimum of a master degree in Information Sciences or closely related area with at least five years track record of relevant professional experience.
- Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (and not FTE) in your descriptions here.
At least fifty percent of courses will be taught by full-time faculty.

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Form PG – Program Characteristics and Performance Goals

- Expectations for professional activities, special student contact, teaching/learning innovation.

  Department Chair and faculty teaching in this program will be expected to:

  1. Conduct research and be professionally active as evidenced by scholarly activities via paper presentations and publication.

  2. They are expected to advise and guide students with their curriculum and professional development planning.

  3. Serve as mentors and provide leadership development opportunities in many capacities, such as club advisors, research coach and team builder.

  4. accompany students to professional organizations and conferences

3. Enrollment Projections

- Student FTE majoring in program by the end of five years.
  20 full-time students

- Percent of full time and part time enrollment by the end of five years. 67% full-time and 33% part-time

4. Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.
  Three years-16 and five years-26

  - Special skills specific to the program.

Upon completion of the program students:

1. would have the advanced skills in cybersecurity management. They should be able to design, implement and deploy cybersecurity managemnt solutions for protecting an organization's information resources

2. Will use the knowledge and skills acquired in the program to identify apprepriate cybersecurity algorithms and protocals to be deployed in the context of an organization's security policy.

3. Analyze, design and implement appropriate incident response in case of security breach.

4. Manage processes including assessing security vulnerabilities of an organization's networks against cyber adversaries.

5. Have a solid understanding of legal and ethical dilemmas and legislative processes as related cybersecurity and information assurance.

- Proportion of students who will achieve licensing, certification, or registration.
  More than 10%

- Performance on national and/or local assessments, e.g., percent of students scoring above the 50th percentile on normed tests; percent of students achieving minimal cut-scores on criterion-referenced tests. Include expected results on assessments of general education and on exit assessments in a particular discipline as well as the name of any nationally recognized assessments used.

More than fifty percent of students completing the National Graduate Major Field Assessment Test for MS in Cybersecurity Manangement or similar exam will score higher than average compared to the national norm.

- Placement rates in related fields, in other fields, unemployed.
  Upon the completion of the program more than eighty percent of graduates will secure a professional career in their field or closely related field. Less than five percent unemployed.

- Transfer rates, continuous study.
  More than eighty percent of graduates either secure a professional positions or continue their education onto a higher degree of education.

5. Program Accreditation

- Institutional plans for accreditation, if applicable, including accrediting agency and timeline. **If there are no plans to seek specialized accreditation, please provide a rationale.**
  The University will pursue program accreditation through Accreditation Council for Business Schools and Programs (ACBSP), International Assembly of Collegiate Business Education (IACBE) and will be included in the next regional institutional accreditation by Higher Learning Commission (North Central Accreditation).

6. Alumni and Employer Survey

- Expected satisfaction rates for alumni, *including timing and method of surveys.*

  More than seventy five percent of graduating seniors and alumni will express their satisfaction with the quality of education provided to graduates of the program. Graduating Senior Exit Survey will be administered annualy by the advisor and individually. Alumni survey will be administred every other year via an e-mail or conventional mail.

- Expected satisfaction rates for employers, including timing and method of surveys.

  More than seventy five percent of employers and internship supervisors who complete the survey will express their satisfaction with the quality of education provided to graduates of the program. Employers survey will be administred every other year via an e-mail or conventional mail.

7. Institutional Characteristics

- Characteristics demonstrating why your institution is particularly well-equipped to support the program.

Harris-Stowe State University traces its origin back to 1857. HSSU is registered as a Historically Black College and University. It is publicly supported and richly diverse in people and programs. HSSU was first institutionally accredited in 1924 by the North Central Association of Colleges and Schools. Today, all programs offered by the School of Business are accredited by Accreditation Council for Business Schools and Programs (ACBSP) and International Assembly of Collegiate Business Education (IACBE).

The Information Sciences and Computer Technology advisory board members represent high executives of the local and regional IT corporations.

The faculty and staff of the Anheuser-Busch School of Business are highly qualified and nationally recognized individuals in their field of study and are equipped with knowledge and skills to deliver a high quality and premier graduate education.
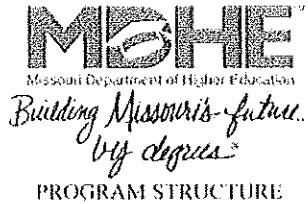
A. Total credits required for graduation: 33

B. Residency requirements, if any: None

C. General education: Total credits: N/A

Courses (specific courses OR distribution area and credits):

Required Core Courses (24 hours)	Credits	Course Title
CM0510	3	Information Security
CM0520	3	Fundamentals of Network Security and Management
CM0530	3	Cryptography and Data Protection
CM0540	3	Legal Ethical Aspects of Information Security and Assurance
CM0550	3	Software and Application Security
CM0560	3	Operating System Security
CM0570	3	Information Security Policy and Risk analysis
CM0580	3	Business Continuity and Disaster Recovery Techniques
Total Core Courses	24	
Electives (9 hours): (3 courses from the list)		
CM0565	3	Information Systems Forensics
CM0535	3	Information Security Operations Management
CM0525	3	Information Resource Management
CM0575	3	Business Driven Information Systems/Mobil Security
CM0585	3	Physical Security
CM0590	3	Advanced Topics in Cybersecurity
CM0595	3	Cybersecurity Project Management
CM0600	6	Master Thesis
Total Electives	9	
Total core Plus electives	33	

Note: All students entering the master program will need the following prerequisites

MATH 0201 Discrete Math This course is intended to provide an introduction to many of the discrete mathematics topics useful to the computer scientist and the mathematician. Topics include characteristics of the number system, sets and logic, proof methods, functions, and relations with additional topics at the discretion of the instructor.

MIS 0315 Introduction to Computer Networks This course covers the protocols of computer network and examines local-area networks, intranet systems and related topics.

D. Major requirements: Total credits: 33

E. Free elective credits:

N/A
(Sum of C, D, and E should equal A.)

F. Requirements for thesis, internship or other capstone experience:
CM0600 is optional to the students

G. Any unique features such as interdepartmental cooperation:
N/A