

ADDENDUM TO AGENDA
UNIVERSITY COMMITTEE ON COURSES AND CURRICULA
November 16, 2018

1. Welcome
2. Approval of Minutes
3. Course proposals by college/school

ENGINEERING

Addition +Online/Distance +Gulf Coast	CSE 4173/6713	Cryptography
Modification	CSE 4383/6383	Network Security
Modification +Online/Distance	CSE 4763/6763	Ethical and Legal issues in Computing

4. Degree proposals by college/school

ENGINEERING

Addition	BS	Cybersecurity
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APPROVAL FORM FOR
DEGREE PROGRAMS
MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College: Engineering

Department: Computer Science and Engineering

Contact Person: Dr. Sharam Rahimi Mail Stop: 9637 E-mail: rahimi@cse.msstate.edu

Nature of Change: New Degree Date Initiated: 8/9/2017 Effective Date: Fall 2019

Current Degree Program Name:

Major:

Concentration:

New Degree Program Name: Bachelor of Science

Major: Cybersecurity

Concentration:

Summary of Proposed Changes:

The Computer Science and Engineering Department requests permission to offer a new BS degree program in Cybersecurity.

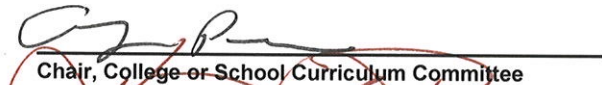
Approved:

Date:



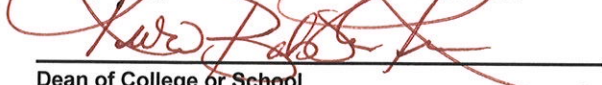
11/8/2018

Department Head



11/12/18

Chair, College or School Curriculum Committee



11/12/18

Dean of College or School

Chair, University Committee on Courses and Curricula

Chair, Graduate Council (if applicable)

Chair, Deans Council

DEGREE MODIFICATION OUTLINE FORM

Use the chart below to make modifications to an existing undergraduate degree outline. If any General Education (Core) course is acceptable in the category, please indicate by saying "any Gen Ed course". There is no need to type in the whole list. All deleted courses and information should be shown in *italics* and all new courses and information in **bold**. Include the course prefix, number, and title in both columns. Expand this table as needed.

PROPOSED Degree Description	
Degree: Bachelor of Science Major: Cyber Security Concentration:	
<p>The Bachelor of Science in Cyber Security and Operations is designed for students who wish to help meet the challenges posed by increasing cyber-threats. Using a multidisciplinary approach, the program is designed to provide students with a focused education for evaluating, understanding, and solving cyber security problems.</p> <p>The Bachelor of Science degree requires the completion of a total of 128 credit hours of general studies, computer science, mathematics and science, and supporting technical courses. To graduate, a student must have a "C" average in all MSU computer science and engineering courses attempted.</p>	
PROPOSED CURRICULUM OUTLINE	Required Hours
EN 1103 English Composition I EN 1113 English Composition II	6
Fine Arts (any General Education course in this category)	3
Humanities (any General Education course in this category)	6
Social Science (any General Education course in this category)	6
Technical Writing GE 3513	3
Communications: CO 1003/CO1013	3
Departmental Requirements:	
MA 1713 Calculus I	3
MA 1723 Calculus II	3
MA 3113 Linear Algebra	3

<p>Math elective:</p> <p>MA 2733 Calculus III, or MA 3053 Foundations of Math., or MA 4143 Graph Theory, or MA 4173 Number Theory</p> <p>IE 4613 Engineering Statistics I</p> <p>BIO 1134 Biological Science I</p> <p>CH 1213 Chemistry I</p> <p>CH 1211 Chemistry Lab</p> <p>PH 2213 Physics I</p> <p>Science Elective:</p> <p>PH 2223 Physics 2, or CH 1223 Chemistry 2 & CH 1221, or BIO 1144 Biology 2</p>	<p>3</p> <p>3</p> <p>4</p> <p>3</p> <p>1</p> <p>3</p> <p>3</p>
<p>Engineering Core:</p> <p>CSE 1002 Intro to CSE</p> <p>CSE 1284 Intro Comp Prog</p> <p>CSE 1384 Intermediate Prog</p> <p>CSE 2383 Data Struc & Analy of Alg</p> <p>CSE 4153 Data Com & Networks</p> <p>CSE 4173 Cryptography</p> <p>CSE 4763 Ethical and Legal Issues in Computing</p> <p>CSE 4733 Operating Systems I</p> <p>CSE 4243 Info & Comp Security</p> <p>ECE 3714 Digital Devices</p> <p>ECE 3724 Microprocessors</p> <p>ECE 4713 Computer Architecture</p>	<p>2</p> <p>4</p> <p>4</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>4</p> <p>4</p> <p>3</p>
<p>Cyber Security Electives</p> <p>BIS 4113: BIS Security</p> <p>CSE 4363: Software Reverse Engineering</p> <p>CSE 4743: Operating Systems II</p> <p>CSE 4773: Intro to Cyber Operations</p> <p>CSE 4253: Secure Software Engineering</p> <p>CSE 4383: Network Security</p> <p>CSE 4273: Digital Forensics</p> <p>Technical Electives</p> <p>Any upper level course in the following areas that is not already required in the Cybersecurity curriculum: CS, ECE, MA</p>	<p>15</p> <p>9</p>

Free Electives	6
Total Hours	128

STUDENT LEARNING OUTCOMES AND ASSESSMENT

The learning outcomes of the program include the following. The graduate will:

- demonstrate an understanding of cybersecurity principles and an ability to solve unstructured cybersecurity problems through the successful entrance into and advancement as a cybersecurity professional in the government or industrial sectors.
- demonstrate an understanding of relevant laws and policies relating to information, computer, and network security.
- demonstrate an appreciation for lifelong learning and for the value of continuing professional development through participation in graduate education, professional education or continuing education opportunities, attainment of professional licensure, or membership in professional societies.
- demonstrate an understanding of professional and ethical responsibilities to the profession, society and the environment incumbent on a computer science professional.
- successfully interact with others of different backgrounds, educations, and cultures.
- demonstrate effective communication skills in their profession.
- demonstrate the ability to develop enterprise policies appropriate to the level of the enterprise in accordance with applicable laws and policies.
- demonstrate the ability to conduct risk assessments of cyber systems, and develop appropriate mitigation strategies to offset those risks.
- demonstrate the ability to perform in an operational cyber environment against adversaries of varying capabilities.
- demonstrate the ability to develop plans for cyber operations in an offensive or defensive posture.

Assessment will be realized through the Institutional Effectiveness report process and later through ABET when those requirements are established.

SUPPORT – **letter of support from curriculum committee attached.**

PROPOSED 4-LETTER ABBREVIATION **CYSO**

EFFECTIVE DATE **Fall 2019**

CIP NUMBER **11.1003**

Appendix 8: New Degree Program Proposal

Institution: Mississippi State University			
Date of Implementation:	Six Year Cost of Implementation:	Per Student Cost of Implementation:	
August 16, 2019	\$ 2,906,553	\$14,533	
Program Title as will Appear on Academic Program Inventory, Diploma, and Transcript:		Six Digit CIP Code:	
Cybersecurity		11.1003	
Degree(s) to be Awarded:	Credit Hour Requirements:		
Bachelor of Science	128		
List any institutions within the state offering similar programs:			
None			
Responsible Academic Unit(s):	Institutional Contact:		
Department of Computer Science and Engineering	Dr. Shahram Rahimi		
Check one of the boxes below related to SACS COC Substantive Changes.			
<input checked="" type="checkbox"/>	Proposed Program <u>is Not</u> a Substantive Change	<input type="checkbox"/>	
		Proposed Program <u>is</u> a Substantive Change	
Number of Students Expected to Enroll in First Six Years:		Number of Graduates Expected in First Six Years:	
Year One	15	Year One	0
Year Two	25	Year Two	10
Year Three	40	Year Three	20
Year Four	40	Year Four	30
Year Five	40	Year Five	35
Year Six	40	Year Six	35
Total	200	Total	130
<p>Program Summary: The Bachelor of Science in Cyber Security and Operations is a focused undergraduate education program in cyber security. The program is designed to satisfy the requirements laid out by the Department of Defense for the Center of Academic Excellence in Cyber Operations program that was awarded to MSU in 2013, as well as the Center of Academic Excellence in Cyber Defense Education originally awarded to MSU in 2001 and most recently renewed in 2014. This would be to offer a full undergraduate degree option in cyber security and operations that would build on the current programs in computer science, software engineering, and computer engineering. Students in this program would be prepared to serve in the government or industry as cyber security engineers, either on the defensive side or operations side. These students would have the skills to move into these jobs with little or no additional training. Additionally, these students would be prepared to continue pursuit of a M.S. in computer science with a concentration in cyber security, or a M.S. in Cyber Security and Operations. MSU is one of only six schools in the country qualified to offer this degree with both defensive and offensive capability, and uniquely qualified in the southeast United States.</p>			
Institutional Executive Officer Signature _____		Date _____	
Institution:			

1. Describe how the degree program will be administered including the name and title of person(s) who will be responsible for curriculum development and ongoing program review.

This program will be administered through the Department of Computer Science and Engineering by an Undergraduate Coordinator to be determined. The curriculum will be managed by an Undergraduate Studies Committee responsible for this degree program, and will be subject to annual review by both this committee, and the external advisory board. Accreditation will be sought through ABET, as soon as accreditation is available and the program has its first graduates.

- Describe the educational objectives of the degree program including the specific objectives of any concentrations, emphases, options, specializations, tracks, etc.

The educational objectives of this degree program are:

- The graduate will demonstrate an understanding of cybersecurity principles and an ability to solve unstructured cybersecurity problems through the successful entrance into and advancement as a cybersecurity professional in the government or industrial sectors.
 - The graduate will demonstrate an understanding of relevant laws and policies relating to information, computer, and network security.
 - The graduate will demonstrate an appreciation for lifelong learning and for the value of continuing professional development through participation in graduate education, professional education or continuing education opportunities, attainment of professional licensure, or membership in professional societies.
 - The graduate will demonstrate an understanding of professional and ethical responsibilities to the profession, society and the environment incumbent on a computer science professional.
 - The graduate will successfully interact with others of different backgrounds, educations, and cultures.
 - The graduate will demonstrate effective communication skills in their profession.
 - The graduate will demonstrate the ability to develop enterprise policies appropriate to the level of the enterprise in accordance with applicable laws and policies.
 - The graduate will demonstrate the ability to conduct risk assessments of cyber systems, and develop appropriate mitigation strategies to offset those risks.
 - The graduate will demonstrate the ability to perform in an operational cyber environment against adversaries of varying capabilities.
 - The graduate will demonstrate the ability to develop plans for cyber operations in an offensive or defensive posture.
2. Describe any special admission requirements for the degree program including any articulation agreements that have been negotiated or planned.

No special admission requirements will be sought for this program.

3. Describe the professional accreditation that will be sought for this degree program. If a SACS visit for substantive change will be necessary, please note.

This degree program does not represent a substantive change from existing programs, as it does not differ from existing programs in computer science, computer engineering, and software engineering by a significant amount. Program accreditation standards are under development by the Accreditation Board for Engineering and Technology (ABET) and program accreditation will be sought as soon as those standards are available and accreditation is possible. Draft criteria for cybersecurity accreditation is:

- **Cyber Defense**, such as cryptography, data security, network security, information assurance.
- **Cyber Operations**, such as cyber attack, penetration testing, cyber intelligence, reverse engineering, cryptanalysis.
- **Digital Forensics**, such as hardware and software forensics, incident response, cybercrime, cyber law enforcement.
- **Cyber Physical Systems**, such as Supervisory Control and Data Acquisition (SCADA) systems, internet-of-things (IOT), industrial control systems.
- **Secure Software Development**, such as secure systems design, secure coding, deployability, maintainability, usability of secure information system.
- **Cyber Ethics**, such as ethical use of information systems, privacy and anonymity, intellectual property rights, professional responsibility, global societal impact of information systems.
- **Cyber Policy, Governance, and Law**, such as government and institutional cyber policy and practices, regulatory authorities for cyber systems and operations, cyber law.
- **Cyber Risk Management**, such as cyber resilience, mission assurance, disaster recover, business continuity, security evaluation, cyber economics.
- **Human Behavioral Relating to Cyber Systems and Operations**, such as social engineering, social networks, user experience, and organizational behavior.
- Describe the curriculum for this degree program including the recommended course of study (appending course descriptions for all courses) and any special requirements such as clinical, field experience, community service, internships, practicum, a thesis, etc.

All students will be required to complete at least 128 hours of course work, including the full university core curriculum. One full year of mathematics and science will be required as well, according to ABET requirements. Additionally, an adequate preparation in computer science, computer engineering, and software engineering subjects will be required.

Requirements:

University Core

- English Composition (6 hours)
- Humanities (6 hours)
- Social Science (6 hours)
- Public Speaking (3 hours)
- Fine Arts (3 hours)
- Technical Writing (3 hours)
- Mathematics
- MA 1713, 1723, 2733: Calculus I, II, and MA 3113 Linear Algebra (9 hours)
- IE 4613: Engineering Statistics (3 hours)
- CSE 2813: Discrete Structures (3 hours)
- Lab Science
- Biology (4 hours)
- Chemistry (4 hours)
- Physics I (3 hours)
- Biology or Chemistry or Physics I (3 hours)

Engineering Core

- Computer Science, Electrical and Computer Engineering, and Business Information Systems
- CSE 1002: Intro to CSE (2 hours)
- CSE 1284 and 1384: Intro and Intermediate Programming (8 hours)
- CSE 2383: Data Structures (3 hours)
- CSE 4153: Data Communications and Networks (3 hours)
- CSE 4243: Info and Computer Security (3 hours)
- CSE 4173: Cryptography (3 hours) NEW
- CSE 4763: Ethical and Legal Issues in Computing (3 hours)
- CSE 4733: Operating Systems I (3 hours)
- ECE 3714: Digital Devices (4 hours)
- ECE 3724: Microprocessors (4 hours)
- ECE 4713: Computer Architecture (3 hours)
- Cybersecurity Electives (15 hours)
 - BIS 4113: BIS Security (3 hours)
 - CSE 4363: Software Reverse Engineering (3 hours)
 - CSE 4743: Operating Systems II (3 hours)
 - CSE 4773: Intro to Cyber Operations (3 hours)
 - CSE 4253: Secure Software Engineering (3 Hours)
 - CSE 4383: Network Security
 - CSE 4273: Digital Forensics (3 hours)

Electives

- Math Elective: MA 2733 Calculus III, MA 3053 Foundations of Math, MA 3253 Differential Equations I, MA 4173 Number Theory (3 hours)
- Technical Elective: Any upper division CSE, ECE, or MA classes (9 hours)
- Free Electives: Any university classes (6 hours)

CSE	1002	Intro to CSE	Two hours lecture. Introduction to the computer science, cyber security and operations, and software engineering curricula, profession, and career opportunities. Historical perspective; support role of the department. Ethics, team building, problem solving.
CSE	1284	Intro Comp Prog	(Pre-requisite: MA 1313 or equivalent). Three hours lecture Three hours laboratory. Introductory problem solving and computer programming using object-oriented techniques. Theoretical and practical aspects of programming and problem solving. Designed for CS, CPE, CYSO and SE majors.
CSE	1384	Intermed Comp Prog	(Prerequisite: CSE 1284 with grade of C or better). Three hours lecture. Three hour laboratory. Object-oriented problem solving, design, and programming. Introduction to data structures, algorithm design and complexity. Second course in sequence designed for CS, CPE, CYSO and SE majors.

CSE	2383	Data Struc & Anal of Alg	(Prerequisite :Grade C or better in CSE 1384 and MA 1713). Three hours lecture. Non-linear data structures and their associated algorithms. Trees, graphs, hash tables, relational data model, file organization. Advanced software design and development.
CSE	4153	Data Comm Networks	(Prerequisites: Grade of C or better in CSE 1384 or ECE 3732, and ECE 3724 . Three hours lecture.The concepts and practices of data communications and networking to provide the student with an understanding of the hardware and software used for data communications. (Same as ECE 4833/6833).
CSE	4243	Info & Computer Security	(Prerequisite: Credit or registration in CS 4733/6733). Three hours lecture. Topics include encryption systems, network security, electronic commerce, systems threats, and risk avoidance procedures.
CSE	4253	Secure Software Engineering	(Prerequisite: Grade of C or better in CSE 3324). Three hours lecture. Principles, techniques, and practices involved in building security into software systems including security requirements analysis, secure design, secure coding and security testing, verification and risk management. Topics also include analysis and security assessment of legacy software systems.
CSE	4273	Intro to Computer Forensics	(Prerequisite: Senior standing in CSE/SE/CPE/MIS/CJ/CYSO) Three hours lecture. Introduction to computer crime and the study of evidence for solving computer-based crimes. Topics: computer crime, computer forensics and methods for handling evidence.
CSE	4363	Software Reverse Engineering	(Prerequisite: CSE 4733/6733). Three hours lecture. Software specification recovery and malicious software analysis. Tools and techniques for analyzing compiled programs and communications in the absence of documentation.
CSE	4383	Network Security (UPDATED)	(Prerequisite: CSE 4153/6153). Three hours lecture. Key Management, Network Security Protocols at different layers of the Network stack., Network Infrastructure Security, Wireless Security, Cloud Security
CSE	4733	Operating Systems I	(Prerequisites: Grade of C or better in CSE 2383 and ECE 3724).Three hours lecture. Historical development of operating systems to control complex computing systems; process management, communication, scheduling techniques; file systems concepts and operation; data communication, distributed process management.
ECE	4713	Computer Architecture	(Prerequisites:Grade of C or better in ECE 3724). Three hours lecture. Detailed design and implementation of a stored-program digital computer system. Designs for the CPU, I/O subsystems, and memory organizations. ALU design and computer arithmetic.
CSE	4773	Intro to Cyber Operations	(Prerequisites: Permission of Instructor). Three hours lecture. This course is designed to develop the students' knowledge of cyberspace operations concepts and methodologies. Graduates should be able to assist in the analysis, synthesis, and evaluation of management, engineering, and operational approaches to solve complex problems within cyberspace, defensive and offensive.
CSE	4763	Ethics and Law in Computing	(Prerequisite: Junior Standing). Three hours lecture. This course will provide students with an advanced understanding of how and why information security laws and policies are developed and managed. Students will learn about existing state and federal laws and explore social and ethical issues related to information technology and computing in today's society.
CSE	4173	Cryptography	(Prerequisite: CSE 2383). Three hours lecture. Discrete Probability, Information Theory, Symmetric Cryptography, Introductory Number Theory, Asymmetric Cryptography, Standard Cryptographic primitives, Cryptographic protocols
ECE	3714	Digital Devices	(Prerequisite: Credit or registration in CSE 1213, CSE 1233, or CSE 1284). Three hours lecture. Three hours laboratory. Binary codes, Boolean, algebra, combinational logic design, flip-flops, counters, synchronous sequential logic, programmable logic devices, MSI logic devices, adder circuits.
ECE	3724	Microprocessors	(Prerequisites: Grade of C or better in both CSE 2383 and ECE 3714). Three hour lecture. Three hour laboratory. Architecture of microprocessor-based systems. Study of microprocessor operation, assembly language, arithmetic operations, and interfacing.

IE	4613	Eng Statistics I	(Prerequisite: MA 1723). Three hours lecture. Introduction to statistical analysis. Topics include: probability, probability distributions, data analysis, parameter estimation, statistical intervals, and statistical inferences.
MA	1713	Calculus I	(Prerequisite: ACT Math subscore 26, or grade of C or better in 1323 or 1453). Three hours lecture. Analytic geometry; functions; limits; continuity; derivatives of algebraic functions; applications of the derivative.
MA	1723	Calculus II	(Prerequisite: Grade of C or better in MA 1713). Three hours lecture. Antidifferentiation; the definite integral; applications of the definite integral; differentiation and integration of transcendental functions.
BIS	4113	BIS Security	(Prerequisite: BIS 3233 or any 3 hours of computer-related coursework). Three hours lecture. Concepts, skills, tools and techniques involved in management of computer security as it applies to today's business environment.
BIO	1134	Biology I	Three hours lecture. Two hours laboratory. Principles of Biology including nature of science, chemistry of life, cell structure and division, cellular respiration, photosynthesis, Mendelian, chromosomal and molecular genetics, evolution, and ecology.
CH	1211	Chemistry I Lab	(Prerequisite: Prior credit or concurrent enrollment in CH 1213). Three hours laboratory. Selected experiments to illustrate fundamentals of chemistry. Accompanies CH 1213.
CH	1213	Chemistry I	(Prerequisites: ACT Math subscore 24 or grade of C or better in MA 1313) Three hours lecture. The principles of atomic and molecular structure, energetics, dynamics, and synthesis as related to chemical systems.
PH	2213	Physics I	(Prerequisite: Grade of C or better in MA 1713). Three hours lecture. Calculus-based course emphasizing Newtonian mechanics and conservation laws. Honors section available.

4. Describe the faculty who will deliver this degree program including the members' names, ranks, disciplines, current workloads, and specific courses they will teach within the program. If it will be necessary to add faculty in order to begin the program, give the desired qualifications of the persons to be added.

- a. Wesley McGrew, Adjunct Instructor, Computer Science, Part-Time Faculty: CSE 4243, CSE 4363, CSE 4753,
- b. Stefano Iannucci, Assistant Professor of Computer Science and Engineering, Computer Science, Full Time Faculty: CSE 4243, 4253, 4273
- c. Joseph Crumpton, Assistant Clinical Professor of Computer Science and Engineering, Computer Science, Full Time Faculty: CSE 4243, 4253, 4273
- d. Mahalingam Ramkumar, Associate Professor of Computer Science and Engineering, Computer Engineering, Full Time Faculty: CSE 4383, CSE 4xx3
- e. Maxwell Young, Assistant Professor of Computer Science and Engineering, Computer Science, Full Time Faculty: CSE 4153
- f. Kent Marett, Associate Professor of Management Information Systems, Information Systems, Full Time Faculty: BIS 4113
- g. David Lee, Adjunct Instructor, Law, Part-Time Faculty: CSE 4763
- h. 3 Tenure-Track Assistant or Associate Professors of Computer Science and Engineering or Electrical and Computer Engineering, qualified to teach cyber security courses

Additional CSE Faculty that will teach Core CSE and Engineering classes required by this degree:

- a. Christopher Archibald, Assistant Professor of Computer Science and Engineering, Computer Science, Full Time Faculty
- b. Ioana Banicescu, Professor of Computer Science and Engineering, Computer Science, Full Time Faculty
- c. Cindy Bethel, Associate Professor of Computer Science and Engineering, Computer Science, Full Time Faculty
- d. Eric Hansen, Associate Professor of Computer Science and Engineering, Computer Science, Full Time Faculty
- e. Lisa Henderson, Instructor of Computer Science and Engineering, Computer Science, Full Time Faculty
- f. T.J. Jankun-Kelly, Associate Professor of Computer Science and Engineering, Computer Science, Full Time Faculty

- g. Sarah Lee, Associate Clinical Professor of Computer Science and Engineering, Computer Science, Full Time Faculty
- h. Edward Luke, Professor of Computer Science and Engineering, Computer Science, Full Time Faculty
- i. Andy Perkins, Associate Professor of Computer Science and Engineering, Computer Science, Full Time Faculty
- j. J. Edward Swan, Professor of Computer Science and Engineering, Computer Science, Full Time Faculty

5. Describe the library holdings relevant to the proposed program, noting strengths and weaknesses. If there are guidelines for the discipline, do current holdings meet or exceed standards?

The Mississippi State University Library holds subscriptions for hundreds of journals related to computer science, electrical and computer engineering, and business information systems. Among them, the following appear to be most relevant to the study of cybersecurity and operations:

- Annual Reviews in Control
- Big Data & Society
- Computers & Security
- Future Generations Computer Systems
- Journal of Computer & System Sciences
- Journal of Information Security and Applications
- International Journal of Critical Infrastructure Protection
- Network Security
- Industrial Management & Data Systems
- Information & Computer Security

Additionally, our library has subscriptions to IEEE Xplore and ACM Digital Library, both of which give us access to a world of journals and conference proceedings related to cyber security and operations. The library's holdings are more than sufficient to support research and study in this domain.

6. Describe the procedures for evaluation of the program and its effectiveness in the first six years of the program, including admission and retention rates, program outcome assessments, placement of graduates, changes in job market need/demand, ex-student/graduate surveys, or other procedures.

Graduates will be assessed through course assessments (exams, quizzes, homework, and laboratory assignments). Periodically, these assessments will be collected and reviewed by the undergraduate studies committee to determine the effectiveness of the teaching. Graduates will also be surveyed as to the strengths and weaknesses of the program. When available, accreditation through the ABET Computing Accrediting Commission will be sought, which will ensure that every six years the program will be assessed for quality. Additionally, the NSA/DHS Center of Academic Excellence program provides an external assessment of all cyber security programs every five years. MSU has been designated a CAE in Cyber Defense Education continuously since 2001, a CAE in Cyber Defense Research since 2008, and a CAE in Cyber Operations since 2013. These designations are aligned with specific degree programs, and require very specific academic criteria be met. Additionally, changes in the job market will be monitored for increases and decreases, but quite frankly, the education system as it is today is incapable of satisfying the job needs, so no decrease is anticipated into the medium future.

7. What is the specific basis for formulating the number of graduates expected in the first six years?

The U.S. cyber command, as well as the Army and Air Force are constantly asking us for graduates with these credentials, and our students are also asking about these degree options. It is estimated that 15% or so of existing computer science students will change to this major immediately upon its approval. Additionally, the number of inquiries asking about this program is increasing regularly, especially since MSU was ranked in the top 5 for cybersecurity education in the United States. These rankings were 3rd for all academic levels in 2014¹ and 5th for graduate cybersecurity education in 2016².

¹ http://www.hp.com/hpinfo/newsroom/press_kits/2014/RSAConference2014/Ponemon_2014_Best_Schools_Report.pdf, downloaded August 11, 2015 at 10:50 AM.

² <https://www.universities.com/articles/10-best-grad-schools-cyber-security/>, downloaded July 26, 2016 at 5:30 PM.



November 7, 2018

University Committee on Courses and Curricula
PO Box 5268
Mississippi State, MS 39762

Dr. Franz:

This letter is provided to document the support of the Department of Computer Science and Engineering at Mississippi State University for the addition of a Bachelor's of Science degree in Cybersecurity. The addition of this degree program to our existing offerings will require the creation of one additional undergraduate class: CSE 4173 – Cryptography. We are also submitting modifications for CSE 4383 Network Security and CSE 4763 Ethics and Law in Computing. With the additional faculty resources included in the Appendix 8 application, the addition of these classes should not place an undue burden on the department's faculty. The department faculty voted unanimously to approve the application for the new degree program, the addition of CSE 4173, and the modification of CSE 4383 in the faculty meeting held on November 7, 2018 with 12 faculty members voting. The modification of CSE 4763 was approved by a subsequent email vote.

This new degree program will add a valuable new dimension to the department's offerings and the new classes will be available not only for this new degree program, but also for students in the existing B.S. programs in Computer Science and Software Engineering.

Sincerely,

Andy D. Perkins, Ph.D.
CSE Courses and Curricula Chair
Associate Professor

Digitally signed by
Christopher Archibald
Date: 2018.11.09
10:06:13 -05'00'

Christopher Archibald
Christopher Archibald, Ph.D.
CSE Courses and Curricula Member
Assistant Professor

Joseph Crumpton, Ph.D.
CSE Courses and Curricula Member
Assistant Clinical Professor

Christopher McDaniel
CSE Courses and Curricula Member
Instructor