

Program Change Request

New Program Proposal

Date Submitted: 11/03/17 4:09 pm

Viewing: **CYBRGC : Cybersecurity Graduate Certificate**

Last edit: 11/10/17 2:32 pm

Changes proposed by: drt

Catalog Pages Using this Program

- [Cybersecurity \(CYBR\)](#)
- [Computer Science and Computer Engineering \(CSCE\)](#)

Submitter:	User ID: srh	Phone: 575-6036
Program Status	Active	
Academic Level	Graduate	
Type of proposal	Certificate	
Select a reason for this new program	Adding New Graduate Certificate (12-21semester hours)--(LON 10)	
Effective Catalog Year	Fall 2018	
College/School Code	College of Engineering(ENGR)	
Department Code	Department of Computer Science and Computer Engineering(CSCE)	
Program Code	CYBRGC	
Degree	Graduate Certificate	
CIP Code	11.1003 - Computer and Information Systems Security/Information Assurance.	
Program Title	Cybersecurity Graduate Certificate	
Program Delivery Method	On Campus	
	Is this program interdisciplinary?	
No		
	Does this proposal impact any courses from another College/School?	
No		
What are the total hours needed to complete the program?	12	

In Workflow

1. ENGR Dean Initial
2. GRAD Dean Initial
3. Provost Initial
4. Director of Program Assessment and Review
5. Registrar Initial
6. Institutional Research
7. CSCE Chair
8. ENGR Curriculum Committee
9. ENGR Faculty
10. ENGR Dean
11. Global Campus
12. Provost Review
13. University Course and Program Committee
14. Graduate Committee
15. Faculty Senate
16. Provost Final
17. Provost's Office-- Documentation sent to System Office
18. Higher Learning Commission
19. Board of Trustees
20. ADHE Final
21. Provost's Office-- Notification of Approval
22. Registrar Final
23. Catalog Editor Final

Approval Path

1. 09/14/17 9:41 am Norman Dennis (ndennis): Rollback to Initiator
2. 09/26/17 10:50 am Norman Dennis (ndennis): Rollback to Initiator
3. 10/03/17 2:40 pm Norman Dennis (ndennis): Approved for ENGR Dean Initial
4. 10/03/17 2:52 pm Patricia Koski (pkoski): Approved for GRAD Dean Initial

Program Requirements and Description

Requirements

Program Description:

The Cybersecurity Graduate Certificate prepares students to protect valuable data assets and develop cyber-centric multidisciplinary security skills for predicting and avoiding cyber threats.

Program Requirements:

Students will be required to take a total of 12 hours to complete the Cybersecurity Graduate Certificate. The 12 hours must include [CSCE 5323](#) Computer Security (Irregular) (required course) and an additional nine hours that can be chosen from the following list of courses:

[CSCE 5433](#) Advanced Cryptography

[CSCE 5833](#) Computer Architecture Security

[CSCE 5333](#) Computer Forensics (Irregular)

- [CSCE 5663](#) Database Security (Irregular)
- [CSCE 5653](#) Network Security (Irregular)
- [CSCE 5763](#) Privacy Enhancing Technologies
- [CSCE 5623](#) Secure Digital System Design
- [CSCE 5753](#) Wireless System Security

Program Costs No additional cost to run the program.

Library Resources No additional library resources to run the program.

Instructional Facilities Will utilize existing instructional facilities.

Faculty Resources Will utilize existing faculty resources.

List Existing Certificate or Degree Programs that Support the Proposed Program

Program(s)
CENGMS - Computer Engineering, Master of Science in Computer Engineering
CENGPH - Engineering (Computer Engineering), Doctor of Philosophy
CSCEMS - Computer Science, Master of Science in Computer Science
CSCEPH - Engineering (Computer Science), Doctor of Philosophy

5. 10/13/17 4:56 pm
Terry Martin (tmartin): Approved for Provost Initial
6. 10/14/17 3:36 pm
Alice Griffin (agriffin): Rollback to Initiator
7. 11/02/17 4:54 pm
Norman Dennis (ndennis): Rollback to Initiator
8. 11/06/17 9:51 am
Norman Dennis (ndennis): Approved for ENGR Dean Initial
9. 11/06/17 9:56 am
Patricia Koski (pkoski): Approved for GRAD Dean Initial
10. 11/08/17 12:46 pm
Terry Martin (tmartin): Approved for Provost Initial
11. 11/10/17 8:04 am
Alice Griffin (agriffin): Approved for Director of Program Assessment and Review
12. 11/10/17 8:52 am
Amanda Corbell (ac087): Approved for Registrar Initial
13. 11/10/17 8:54 am
Gary Gunderman (ggunderm): Approved for Institutional Research
14. 11/10/17 9:20 am
Xiaoqing Liu (frankliu): Approved for CSCE Chair
15. 11/10/17 9:25 am
Manuel Rossetti (rossetti): Approved for ENGR Curriculum Committee
16. 11/10/17 11:29 am
Norman Dennis (ndennis): Approved for ENGR Faculty
17. 11/10/17 11:30 am
Norman Dennis (ndennis): Approved for ENGR Dean
18. 11/10/17 12:08 pm
Kiersten Bible

Are Similar Programs available in the area?

No

Estimated Student Demand for Program 10-15

Scheduled Program Review Date 2024-2025

Program Goals and Objectives

- (kbible): Approved for Global Campus
- 19. 11/10/17 12:49 pm
Terry Martin
(tmartin): Approved for Provost Review
- 20. 11/20/17 2:50 pm
Alice Griffin
(agriffin): Approved for University Course and Program Committee
- 21. 12/20/17 9:09 am
Patricia Koski
(pkoski): Approved for Graduate Committee

Program Goals and Objectives

The objectives of the Cybersecurity Graduate Certificate are aligned with both the NIST Framework for Improving Critical Infrastructure Cybersecurity (NIST, 2017) and with the draft National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework (NCWF) (NICE, 2016) that has been under development by the National Institute of Standards and Technology (NIST). Note that the NICE Cybersecurity Workforce Framework is used by the Federal Office of Personnel Management as a guide to assign cybersecurity codes to federal positions with information technology, cybersecurity, and cyber-related functions (OPM, 2016).

Cybersecurity Graduate Certificate graduates will:

- Possess a comprehensive understanding of the core cybersecurity functions to identify risks, assess risks, protect services, detect events, respond to events, and recover from events.
- Be able to securely provision, operate and maintain, oversee and govern, protect and defend, analyze, collect and operate, or investigate information technology (IT) systems and/or networks.
- Enhance Arkansas' and the nation's cybersecurity industry.
- Demonstrate professional skills and behavior.

References:

National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework (NCWF), Draft NIST Special Publication 800-181, National Institute of Standards and Technology (NIST), Nov. 2016.

NIST Framework for Improving Critical Infrastructure Cybersecurity, Draft version 1.1, National Institute of Standards and Technology (NIST), Jan. 10, 2017.

OPM Federal Cybersecurity Coding Structure, Office of Personnel Management (OPM), Nov. 15, 2016.

Learning Outcomes

Learning Outcomes

The expected student learning outcomes for a student completing the Cybersecurity Graduate Certificate are based on draft ABET documents (ABET, 2016) and the NICE Cybersecurity Workforce Framework (NICE, 2016).

- An ability to apply security principles and practices to the environmental, hardware, software, and human components of a system.
- An ability to analyze and evaluate systems with respect to maintaining operations in the presence of risks and threats.

References:

ABET Cybersecurity Accreditation. 2016. https://www.fbcinc.com/e/nice/presentations/2016/Track_D_Century_C/D-9_Part_B_Parrish_2016-10-28.pdf

Description and Justification for this request

Description of request	Justification for request
Adding a certificate program in Cybersecurity.	Reason for proposed program implementation: A recent proposal by the Arkansas Security Research and Education Institute (ASCENT) for government cybersecurity scholarships included nine letters from federal and state agencies interested in recruiting cybersecurity professionals (see Appendix A). If this proposal is funded, it will increase the demand for the courses and the certificate by providing 6-8 two-year cybersecurity scholarships each year over a five-year period. Another proposal by ASCENT for data-driven security solutions in retail, food, and transportation had ten letters of support from commercial industries interested in cybersecurity technologies and student recruitment (see Appendix B). These government and industrial employers have strong

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	<p>interests in cybersecurity find it difficult to find qualified cybersecurity employees.</p> <p>The security challenges facing the United States are increasing and evolving in complexity. A connected world means that cybersecurity reaches almost every industry. Therefore, industries that drive our economy leave the nation vulnerable to new threats. Four out of ten companies that were the victims of cyber-attacks said that losses were substantial with one third of the companies reporting a loss of revenue of 20% or more (Cisco, 2017). Data breaches in which medical and/or financial records are potentially put at risk had a total average cost of \$3.62 million in a recent survey of over 400 companies (Ponemon Institute, 2017). Amongst the largest of the challenges faced by organizations is that cyber influences are prevalent and daunting due to the numerous motives for bad actors to profit/gain from the information gathered. Unfortunately, these new challenges are met with an increasingly insufficient security workforce. In traditional cybersecurity alone, 209,000 jobs went unfilled in the US (Intel, 2016) and 1 million jobs went unfilled worldwide (Cisco, 2015). As recently as August 2016, a survey showed that only 23% of existing professionals believe that existing security education programs are effective in preparing future security workers (EAB, 2016). The new Cybersecurity Graduate Certificate responds to the need for the future security workforce.</p> <p>References:</p> <p>Cisco (2015). http://www.cisco.com/c/dam/en/us/products/collateral/security/cybersecurity-talent.pdf</p> <p>Cisco 2017 Annual Cybersecurity Report, cisco.com/go/cybersecurity</p> <p>EAB, 2016. There's a cybersecurity expert shortage: colleges can help. <https://www.eab.com/daily-briefing/2016/08/05/theres-a-cybersecurity-expert-shortage-colleges-can-help></p> <p>Intel. Global Study Reveals Businesses and Countries Vulnerable Due to Shortage of Cybersecurity Talent (2016). Retrieved 23 March 2017 from https://newsroom.intel.com/news-releases/global-study-reveals-businesses-countries-vulnerable-due-shortage-cybersecurity-talent/</p> <p>Ponemon Institute LLC, "2017 Cost of Data Breach Study", www.ibm.com, June 2017</p>

Upload attachments [CYBRGC - Graduate Cert - Ltr of Notification.docx](#)
[CYBRGC AppendixA.pdf](#)
[CYBRGC AppendixB.pdf](#)

Reviewer Comments **Norman Dennis (ndennis) (09/14/17 9:41 am)**: Rollback: You have not defined a 12-21 hour program. There are 45 hours of listed courses with not roadmap to tell the committees what is actually required.

Norman Dennis (ndennis) (09/26/17 10:50 am): Rollback: you have three CSCE 5013s in this program that currently do not have areal course number to match the title. Please submit those courses to have a separate course numbers before resubmitting this certificate request.

Norman Dennis (ndennis) (10/03/17 2:40 pm): Added Catalog description.

Alice Griffin (agriffin) (10/14/17 3:26 pm): Highlighted courses so the offerings could be listed in the catalog copy.

Alice Griffin (agriffin) (10/14/17 3:36 pm): Rollback: No changes have been submitted for the course change to CSCE 5433 to become CSCE 6433. Changes have been saved but not submitted for CSCE 5753 for a new course. Please submit course changes into Course Inventory. Also revised the LON to include the correct course numbers and course titles. Then, resubmit your request.

Norman Dennis (ndennis) (11/02/17 4:54 pm): Rollback: There are four courses (highlighted in red boxes above) that are currently sitting at the department head approval level Those course proposals do not contain syllabi which have 3 to 5 student learning outcomes. Until those course proposals are supplied with appropriate syllabi they will not be approve and this program change will not move forward. You may ignore Alice's comment regarding CSCE 6433 if you do not intend to change the course number. Please get the new course proposal in good order before resubmitting this program proposal.

Alice Griffin (agriffin) (11/10/17 8:04 am): Revised approval dates in LON and renamed document to match BOT naming convention.

Amanda Corbell (ac087) (11/10/17 8:52 am): courses not found pending approval process

Alice Griffin (agriffin) (11/10/17 2:32 pm): Renamed appendices to match naming convention for BOT documents.

Key: 642