

MEMORANDUM

TO: 2023-2024 Senate Executive Committee  
 FROM: Teri Hogg  
 Chair, Undergraduate Curriculum Subcommittee  
 DATE: April 16, 2024  
 SUBJECT: Certificate in Cyber Security

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The Undergraduate Curriculum Subcommittee reviewed and supported the proposal from the College of Engineering, Technology and Computer Science (ETCS) for a new certificate in Cyber Security. We find that the proposal requires no Senate review.

Thank you for the opportunity to review this new concentration.

Approved	Opposed	Absent	Non-Voting
Laurel Campbell Claudio Freitas, Teri Hogg Lee Roberts Xiaoguang Tian		Emily Tock Jordan Marshall	Terri Swim

**Degree/Certificate/Major/Minor/Concentration Cover Sheet**

Date:

Institution: Purdue

Campus: Fort Wayne

School or College:

Department:

Location:                                      80% or more online: Yes      No

County:

Type:

Program name:

Graduate/Undergraduate:

Degree Code:

Brief Description:

Rationale for new or terminated program:

CIP Code:

Name of Person who Submitted Proposal:

Contact Information (phone or email):

## Request for a New Certificate Program

Campus:     Ft. Wayne    

College/School and Department:     School of Polytechnic    

Proposed Title of Certificate Program:     Cyber Security    

Projected Date of Implementation:     Spring 2025    

TYPE OF CERTIFICATE: (check one)

UNDERGRADUATE CERTIFICATE: Award of less than 1 academic year; requires less than 30 credits of undergraduate-level academic work. (most common – undergraduate)

UNDERGRADUATE CERTIFICATE: Award of at least 1 academic year but less than 2 academic years; requires less than 31-60 credits of undergraduate-level academic work. (most common – undergraduate)

POST-BACCALAUREATE CERTIFICATE – These programs generally require 12-29 credits of graduate-level academic work; all students enrolling in these programs must have completed their baccalaureate degrees. (most common – graduate)

POST-MASTERS CERTIFICATE – These programs generally require 12-18 credits of graduate-level academic work; all students enrolling in these programs must have completed their Master's degrees.

### Technical Characteristics of Certificate

- Certificate Description: *A brief explanation of what the student experience and/or learn; no more than 2-3 sentences. This can be published in the Catalog.*

The certificate in Cyber Security is a mixture of information technology and cyber security theoretical and practical knowledge. Completion of this certificate will provide the skill set that will enable you to work in the information technology areas of networks, cyber security, or information assurance.

- CIP Code: 43.0404
- Modality: Proposal must speak to all selected modalities. – Residential and Hybrid
  - Residential
  - Hybrid
  - Online

If hybrid or online, please respond to the following prompts/questions:

- a. What technologies will be used to give students access to instruction?
  - Brightspace
- b. If the program is being offered residential and digitally (hybrid and/or online), the curriculum offered identical?

- Yes
- c. If applicable, explain how students will complete labs, studios, clinicals, etc.
  - Labs will be completed both in the physical laboratory and virtual environment on the computer
- If more than one modality selected, will the curricula be identical across modalities?
  - Not Applicable - only one modality
  - **Yes**
  - No
- Number of credits required in Certificate program
  - 18 Credits
- Describe target audience to be served as well as the goal for the number of participants.
  - Target audience would be professionals and students who are looking to gain deeper knowledge into all aspects of computer cyber security and policy. This program can serve professionals in almost any industry who wants to gain more information in cyber security. Protecting data/digital assets in hospitals, schools, and businesses is all the more important given our current cyber environment. The flexibility of the certificate (e.g. number of directed electives) allows more flexibility for professionals in a variety of industries to tailor the program to their current needs.
  - Students in other PFW programs who have an interest in cyber security could be served by this certificate as well. For example, this could help accounting majors who need additional credits to qualify to sit for the CPA exam. The certificate could help them where ever they are employed, but the IT Auditing course could open a branch of accounting that would not be available to them otherwise.
  - Continuing studies will be contacted to help with recruiting community members as will our existing Industry Advisory Board. From those efforts, we expect to have a minimum of 10 professionals enroll in the certificate.
- Admission requirements– *Please include any specific requirements above and beyond the standard entry requirements for Applicants.*
  - *None*
- List all specific **program completion** requirements, including courses, minimum course GPA, minimum overall GPA, number of credits completed in residence, maximum time allowed from the completion of the first course, how many courses can be applied to another certificate or program of study, etc.
 

All six (6) courses must be passed with at least a C- to count. At least 12 credits must be completed in residence. A maximum of 2 classes can be applied to another certificate. Must be completed within 5 years.

Required Courses			
Course #	Course Name	Credits	Changes to courses*
ITC 11000	IT Fundamentals	3	
ITC 33100	Networks 1	3	
ITC 41400	Information Assurance	3	
Choice of 3 of the following courses:			
ITC 32200	Incident Response Mgmt.	3	Change to P: ITC11000
ITC 32800	Cryptography	3	
ITC 41200	IT Auditing	3	Change to P: ITC33100 or ITC18000 (removed ITC35000)

ITC 41500	Intrusion Detection	3	
ITC 41700	Digital Forensics	3	
ITC 41800 or CS44500	Computer Security	3	
ITC 44000	Cloud Computing	3	

\* The changes to the prerequisites allow students to meet prerequisites for each optional course.

## Academic Characteristics of Certificate

- Why is this certificate needed?
  - The demand for cyber security professionals has been increasing steadily over the past few years. This certificate will enable professionals from different types of industries to obtain the necessary knowledge and skills in cyber security.
  - If we don't have people protecting our digital assets, we are at risk of our personal information being compromised. Currently there are not enough knowledgeable people to meet the demand. This is evidenced by a 32% projected growth in cyber security jobs in the US and 33% projected growth in Indiana (onetonline.org) for Information Security Analysts. This represents over 16,500 job openings between 2022-2032 in the US.
  - The knowledge and skills acquired in this certificate open professionals to higher salaries. The average salary for this occupation is \$77,470 in Fort Wayne, IN.
  - While no formal study has been conducted, students inquire about additional course options in cyber security on a weekly basis. Until now, we are unable to expand our course offerings due to a lack of faculty. With support from Dean Elfayoumy, we have hired a faculty member with deep knowledge in this area to begin addressing this need.
- Prospective Curriculum: *Please create a plan of study for the degree. If new courses are being created, all course proposals must be completed in order to add to this block.*
  - The program is divided into required courses and directed electives.
  - Required: ITC 11000 - IT Fundamentals and ITC 33100 - Networks are required of all students and serve as the foundation of other courses (i.e. pre-requisite). ITC 41400 - Information Assurance is also required for all students.
  - Directed electives: Students will select three courses from the list. These courses can be taken after the two foundational courses have been completed.
  - Four courses were created for the new program options in Cyber Security. They are:
    - i. ITC 32200 – Incident Response Mgmt.
    - ii. ITC 32800 – Cryptography
    - iii. ITC 41500 – Intrusion Detection
    - iv. ITC 41700 – Digital Forensics
  - These courses have been entered into Curriculog for approval. All course approvals should be completed by the time the Cyber Security programs have been approved.
- Learning outcomes for Certificate:
  1. Understand the terminology of threats, vulnerabilities, and controls
  2. Construct proper security plans and the creation of security policies
  3. Apply access controls
  4. Understand and apply cryptography principles

5. Implement security policies in the protection of General-Purpose Operating Systems
  6. Apply authentication techniques to provide secure communication
  7. Use software to identify vulnerabilities in computer systems and network devices.
  8. Understand network security threats and countermeasures such as IPSec, SSL/TLS
  9. Apply knowledge of intrusion detection to protect assets
  10. Use digital forensic principles to identify and analyze electronic data
  11. Evaluate infrastructure to determine proper controls and procedures
  12. Knowledge with Email security and Web security
  13. Familiarization with legal, privacy and ethical issues in computer security
- Explain how student learning outcomes will be assessed (student portfolios, graduate and/or employer survey, standardized test, etc.) and describe the structure/process for reviewing assessment findings for the purpose of ensuring continuous improvement of the certificate.
    - This certificate will be assessed by both direct and indirect course surveys and employer surveys. This process has been approved/supported by previous ABET accreditation reviews/feedback. To be more specific, students provide feedback on what they learned in terms of each Learning Outcome (LO) for the Certificate. Then, faculty assess, for each course, each students' performance on the LO based on their performance on specific assignments (e.g., LO 1 is aligned with exam 1 and Homework 3).
  - How does this certificate complement the university's/department's/school's strategic plan(s)?
    - The College of ETCS has set forth a goal of providing both theoretical and hands on cyber security curriculums. This field is growing very quickly and the demand for cyber security professionals outweighs the supply.
    - As the only public institution in Northeast Indiana, we can offer a high-quality program at a reasonable cost to working professionals.
  - Describe any innovative features of the program (e.g., involvement with local or regional agencies, or offices, cooperative efforts with other institutions, etc.).
    - By creating this certificate and courses, we will be working towards obtaining National Security Administration (NSA) Center for Academic Excellence in Cybersecurity (CAE-C) with a focus in Cyber Defense (CAE-CD). The CAE-CD designation is awarded to regionally accredited academic institutions offering cybersecurity degrees and/or certificates at the associate, bachelor's and graduate levels. As a marker of program quality, this designation provides evidence of eligibility for NSA grants for the benefit and ease of applying for grants and allows NSA to identify potential NCAE-C institutions for grant solicitations.
  - Describe any relationship to existing programs on the campus or within the university.
    - This certificate will use existing core and approved technical elective courses from the B.S. in Information Technology program.
    - The new courses will become a part of the technical elective courses.
  - List and indicate the resources required to implement the proposed program. Indicate sources (e.g., reallocations or any new resources such as personnel, library holdings, equipment, etc.) of resources.
    - Reallocate .25 of Information Technology faculty to teach the cybersecurity curriculum.
    - No library resources would be required
  - Liaison Library Memo attached
  - Gainful Employment Certificate Worksheet attached.

## Liaison Librarian Memo

Date:

From:

To:

Re:

Describe availability of library resources to support proposed new program:

Comments:

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*Sarah Wagner* *3-4-2024*  
*Liaison Librarian Signature* *Date*

## Library Resources

Address the following issues regarding the impact of the new program on the library's budget and personnel. Please respond to each item below indicating the library sources and services required to support the proposed program.

- Which databases/indexing sources will be used by the courses in this program?
  - None
- What are the journals that will be used by students completing library research in this program? Please list three to five titles.
  - None will be needed
- Is there an expectation that access to new journals will need to be purchased for students in this program?
  - No
- Are there any specific reference sources (e.g. encyclopedias, handbooks, standards, etc.) required to support the new program?
  - No
- Is there an expectation for additional books to be purchased? What about DVD or audio/visual materials? What is the estimated dollar amount needed yearly to support this program with new books and media materials?
  - No
- Will the new program use the Library's Document Delivery Services? Costs for this service come out of the Library's budget. What types of materials would the program be requesting through DDS?
  - No
- Who is the liaison librarian for this program? The liaison librarian provides support through involvement in Blackboard-supported classes, one-on-one research consultations, in-class instructional sessions, and tailored course guides for research assignments. Which of these librarian services do you anticipate will be utilized in the new program?
  - Sarah Wagner
  - None
- Memo from Liaison Librarian regarding resources.
- Is there an accrediting body that will be overseeing this program? What are the statements of the accrediting body related to the library, e.g. holdings, personnel, services?
  - ABET/CAC

“The library services and the computing and information infrastructure must be adequate to support the scholarly and professional activities of the students and faculty”



# Purdue University Fort Wayne Gainful Employment (GE) Form

(must accompany Graduate Certifications Proposals)

**TO BE COMPLETED BY DEPARTMENT CHAIR/DIRECTOR**

**Application for Review for Title IV Federal Student Aid Eligibility**

**NAME OF PROGRAM:** Cyber Security Certificate

**DEPARTMENT:** School of Polytechnic

**SCHOOL/COLLEGE:** ETCS

A program eligible to participate in Title IV federal student aid would be considered a Gainful Employment Program if it can be completed as a standalone certificate program and prepares students for "gainful employment in a recognized occupation." A review and documentation of these criteria is essential prior to program implementation. Failure to meet these criteria may jeopardize Purdue University's eligibility to award federal student financial aid or take part in other programs under the Higher Education Act. Final approval for eligibility may be determined by the U.S. Department of Education.

QUESTION	ELIGIBILITY CRITERIA
<p>1. Is this a standalone certificate program?</p> <p>2. Is the student required to be enrolled in a degree-seeking program while pursuing this certificate?</p> <p>3. Would this certificate alone prepare a student for gainful employment in a recognized occupation?</p> <p>4. Is the program a one-year minimum training program that leads to a degree (or other recognized educational credential) and prepares students for gainful employment in a recognized occupation?</p>	<p>1. <input checked="" type="checkbox"/> Yes    ___ No</p> <p>2. ___ Yes    <input checked="" type="checkbox"/> No</p> <p>3. <input checked="" type="checkbox"/> Yes    ___ No</p> <p style="margin-left: 40px;">If YES, list the Standard Occupation Code(SOC): <u>15-1212.00</u></p> <p style="margin-left: 40px;"><i>(The Department of Labor's Standard Occupational Code (SOC) must be provided to show the occupation that the program prepares students to enter and can be found on the Department of Labor's O*NET website - <a href="http://www.onetonline.org">http://www.onetonline.org</a>)</i></p> <p>4. <input checked="" type="checkbox"/> Yes    ___ No</p> <p style="margin-left: 40px;">If YES, describe how this program prepares the student for gainful employment:</p> <p style="margin-left: 40px;"><u>Develops skills in the information technology, network,</u></p> <p style="margin-left: 40px;"><u>cyber security and information assurance disciplines.</u></p> <p style="margin-left: 40px;">_____</p> <p style="margin-left: 40px;">_____</p> <p style="text-align: center;"><b>***If you answered NO to all of the above – STOP HERE. Certificate is not eligible for Gainful Employment***</b></p>

AREA OF REVIEW	ELIGIBILITY CRITERIA
Academic Year Definition Requirements	<p>Number of weeks of instructional time per academic year for this program: <u>32</u> In an academic year, a full-time student must complete at least <u>12</u> semester hours.</p> <p>(NOTE: Federal regulations define academic year as a period of a minimum of 30 weeks of instructional time. In an academic year, a week of instructional time is any week in which at least one day of regularly scheduled instruction or examination occurs, or at least one day of study for exams for final exams if it occurs after the last scheduled day of classes for the semester. Instructional time does not include periods of orientation, counseling, vacation, or any other activity not related to class preparation or examinations. Internships, cooperative education, and independent study are forms of instruction that may be included in the definition of academic year. For an undergraduate educational program, an academic year is a period a full-time student must complete at least 24 semester hours.)</p> <p>The length of the program is <u>&lt; 1</u> academic years. (Federal regulations require that the program length is at least two academic years and provides an associate, bachelors, graduate, or professional degree or a one-year training program that leads to a degree or certificate (or other recognized educational credential) and prepares students for gainful employment in a recognized occupation.)</p> <p><b>Department Head (please attach a Program of Study documenting the following):</b></p> <ul style="list-style-type: none"> <li>This program prepares students for gainful employment in the same or related recognized occupation as an educational program that has previously been designated as an eligible program at Purdue University Fort Wayne.</li> </ul>
Document(s) Required	If program proposal and approvals (Faculty Senate, Vice Chancellor for Academic Affairs, and Provost's Office, and the Indiana Commission for Higher Education, if applicable) are not on file with the Office of Academic Affairs, you may be asked to provide documentation.

*Michelle Parker*

2-28-2024

Signature: Department Head

Date

When Completed Send to:

Ron Herrell, Director of Financial Aid,  
Purdue University Fort Wayne  
2101 E. Coliseum Blvd, KT 103B  
Fort Wayne, IN 46805  
rherrell@pfw.edu

Office Use: This program is

**Eligible** – Based on submitted documentation, the Division of Financial Aid has determined that this certificate IS ELIGIBLE for Title IV federal student aid.

**Ineligible** – Based on submitted documentation, the Division of Financial Aid has determined that this certificate IS INELIGIBLE for Title IV federal student aid.

*R. Herrell*  
Signature: Director of Financial Aid

4/15/24  
Date



## Undergraduate Academic Program Memo

**Date:** 2/28/24

**From:** Michelle Parker

**To:** Dr. Sherif Elfayoumy, Dr. Carl Drummond

**Re:** Cyber Security Certificate

### Brief description of the program:




The certificate in Cyber Security is a mixture of information technology and cyber security theoretical and practical knowledge. Completion of this certificate will provide the skill set that enables a person to work in the information technology areas of networks, cyber security, and/or information assurance.

### Brief rationale for program request:

The demand for cyber security professionals has been increasing steadily over the past few years. This certificate will enable students from all disciplines to obtain the necessary background in cyber security. Jobs in the cyber security area are projected to grow by 32% in the State of Indiana.

**CIP Code:** 43.0404

**For completion by Office of Academic Affairs**

<small>DocuSigned by:</small>  <small>4E345542E1EA497...</small>	4/12/2024
<i>Department Chair Signature</i>	<i>Date</i>
<small>DocuSigned by:</small>  <small>5CC32880FFC14FA...</small>	4/15/2024
<i>School Dean Signature</i>	<i>Date</i>
<small>DocuSigned by:</small>  <small>27109142004745C...</small>	4/11/2024
<i>Vice Chancellor for Academic Affairs Signature</i>	<i>Date</i>

PLEASE NOTE: The Office of Academic Affairs will collect electronic signatures from the Chair, Dean, and Vice Chancellor for Academic Affairs after the form has been filled out and submitted to the Associate Vice Chancellor for Academic Programs with the rest of the program proposal.