PURDUE UNIVERSITY BOARD OF TRUSTEES
EXECUTIVE SUMMARY DEGREE PROPOSAL TEMPLATE

PLEASE NOTE THAT THE FULL PROPOSAL CHECKLIST WILL NEED TO BE COMPLETED FOR THE INDIANA COMMISSION ON HIGHER EDUCATION (see https://in.gov/che/files/checklist_of_criteria_web.pdf) Both this template and the full checklist document are submitted to the Purdue Board of Trustees. When this form is complete, please save and return to weiderhaft@purdue.edu with tables as separate attachment.

DATE: **March 3, 2022**
TO: Board of Trustees
FROM: Keyuan Jiang, Primary Contact, (219) 989-2498; kjiang@pnw.edu
CC: Niaz Latif, Secondary Contact, (219) 989-3251; nlatif@pnw.edu
SUBJECT: Bachelor of Science in Cybersecurity

CAMPUS OFFERING DEGREE: Purdue University Northwest (PNW)

ANTICIPATED START DATE: Fall 2022

1.   IS THE DEGREE RESIDENTIAL, HYBRID, OR ONLINE?
IF ONLINE, RATIONALE FOR GOING THROUGH SPECIFIC PURDUE CAMPUS—PWL, PFW, PNW, PG

Residential.

2.   BRIEF OVERVIEW OF DEGREE/WHY IS THE DEGREE NEEDED?

The Bachelor of Science in Cybersecurity program offered at Purdue University Northwest (PNW) prepares students with the technical competency, knowledge, and skills needed to protect networks, systems, programs, and data from criminal or unauthorized use. Students will learn concepts, knowledge, skills, technologies, and practices in a broad spectrum of cybersecurity areas, including the emerging fields of applied data science and artificial intelligence. The program is hands-on and application-oriented. Upon the completion of the program, students will be ready to take highly-sought-after industry certification exams.

We are living in a world that relies heavily on technology. The use of technology positively impacts and, indeed, is critical to our lives in many ways, but also exposes us to the risk of cyber threads and attacks. The increasing frequency of cyber attacks of constantly changing nature have made cybersecurity a necessary practice to prevent and mitigate the negative impacts and risks to the security of business and financial systems. As defined by the U.S. Cybersecurity and Infrastructure Security Agency (CISA), cybersecurity is the practice of protecting networks, systems, programs, and data from criminal or unauthorized use. Maintaining and developing a sufficient cybersecurity workforce is the key to assuring that the nation has adequate capacity to protect information and information systems. A joint report by the Secretary of Commerce and Secretary of Homeland Security states that the "United States needs immediate and sustained improvements in its cybersecurity workforce" and notes that employers are increasingly concerned about the number of cybersecurity-related education programs available to meet the needs of their organizations. The Secretaries recommended that "the Nation should set an ambitious vision and action plan-of-attack to prepare, grow, and sustain a national cybersecurity workforce that safeguards and promotes America's national security and economic prosperity."

According to CyberSeek, between October 2020 and September 2021, the United States employed one million people in cybersecurity-related positions, yet nearly 600,000 cybersecurity openings were open to be filled, and the supply of cybersecurity workers remained low. A recent study by Burning Glass Technologies, an analytics software company that provides real-time data on job growth, skills in demand, and labor market trends, found that cybersecurity job postings have grown by 94% since 2013, three times faster than other positions in the IT industry. And because of the shortage of employees with cybersecurity education and skills, vacant cybersecurity positions take 20% longer to fill than do other IT positions.

The U.S. Department of Labor's Bureau of Labor Statistics predicts that cybersecurity jobs will grow by 33% from 2020 to 2030 in the U.S. The Bureau also indicates that typical entry-level education requirement for cybersecurity is a bachelor's degree. In 2019, Cybersecurity Ventures reported that only three percent of

college graduates had cybersecurity-related skills, which is a stark indicator of the wide skills gap in cybersecurity job market. The 2021 International Information Systems Security Certification Consortium -- (ISC)[2] -- Cybersecurity Workforce Study showed that cybersecurity professionals considered the workforce gap to be the number one barrier to meeting their security needs, and two-thirds of study participants noted that a cybersecurity staffing shortage is placing their organizations at risk. Creating this cybersecurity bachelor degree program will help fill the supply-and-demand gap in cybersecurity workforce, and meet the growing needs of cybersecurity job market.

3. BRIEF EVIDENCE OF FEDERAL, STATE, AND REGIONAL LABOR MARKET NEED

Cybersecurity positions are generally classified as "information security analysts," and the 2020 Department of Labor's Bureau of Labor Statistics data show that there were 141,000 jobs for this classification (SOC 15-1212). The need for these cybersecurity professionals was expected to grow by 33% from 2020 to 2030, adding 47,100 jobs, which is "much faster than average."

The 2018 Occupation Snapshot of the state of Indiana shows that there were 1,266 jobs for information security analysts and it was expected to grow by 25.9% from 2018 to 2028, or 128 jobs every year. The 2018 Occupation Snapshot of Indiana Economic Growth Region 1 (EGR 1), which includes Lake, Porter, La Porte, Newton, Jasper, Starke, and Pulaski counties, indicates that there were 58 jobs, with expected growth of 17.2% from 2018 to 2028. Both the state and regional occupation outlooks have a "3 star" INDemand ranking.

An analysis of cybersecurity workforce and job openings for Indiana and the metropolitan area of Chicago-Naperville-Elgin, IL-IN-WI, where Purdue Northwest is located, shows *very low* supply of cybersecurity workers, with over 20,500 openings and a total cybersecurity workforce of slightly over 12,000.

4. COSTS

Tuition and Fees—In-state and out-of-state

Less than 12 credit hours (charged per credit hour)

	Tuition	Composite Fee	Totals
Indiana Resident	$242.25	$26.30	$268.55
Non-Resident	$363.35	$26.30	$389.65
International	$580.55	$26.30	$606.85

Single Banded Rate (12-18 credit hours, per semester)

	Tuition	Composite Fee	Totals
Indiana Resident	$3,633.80	$394.60	$4,020.40
Non-Resident	$5,450.60	$394.60	$5,844.20
International	$8,707.90	$394.60	$9,102.50

The annual (academic year) tuition and fees for undergraduate programs at PNW (at the 2021-2022 rate) for full-time students (12-18 credit hours per semester, single banded rate) pursuing a B.S. in Cybersecurity (120 credit hours) is as follows:

Annual Costs:

	Tuition + Composite + Differential	Lab Fees
Indiana Resident	$8,596.00	$70.35 per lab hour
Non-Resident	$12,2243.60	$70.35 per lab hour
International	$18,760.20	$70.35 per lab hour

A.   Financial Projection Table
     https://www.purdue.edu/provost/policies/iche.html (Table 1)

     See below.

B.   Program Review and Expenditure Summary
     https://www.purdue.edu/provost/policies/iche.html (Table 2)

     See below.

D.   Enrollment Projection
     https://www.purdue.edu/provost/policies/iche.html (Table 3)

5.   LIST OF SIMILAR DEGREES IN THE PURDUE SYSTEM AND DISTINCTIVE ELEMENTS FOR THIS DEGREE

Similar Degree Programs in the Purdue System

- B.S. in Cybersecurity – Purdue West Lafayette
- B.S. in Cybersecurity – Purdue Global
- B.S. in Cybersecurity - IUPUI

Distinctive Elements

- It is a degree program with a strong focus on technology, developed based upon the existing BS in Computer Information Technology (CIT) which was created based upon ACM/IEEE-CS Information Technology curricula that considers computer security as the overarching theme.

- The proposed degree program will be migrated from the existing cybersecurity concentration which was launched in Fall 2019. The cybersecurity concentration within the B.S. in Computer Information Technology has seen a healthy growth since the launch. There are 81 students in the concentration as of Spring 2022.

- It will prepare students for highly-sought-after industry cybersecurity certifications such as Certified Ethical Hacker (CEH).

- The degree provides students with an opportunity to pair cybersecurity with the emerging field of artificial intelligence through a minor in Applied Data Science, which is offered by the same program faculty.

- By completing this new degree program, students will be prepared with the education, knowledge, skills, and abilities to be qualified in the following National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework job categories: Operate and Maintain, Protect and Defend, Analyze and Investigate.

- Since 2014, U.S. Homeland Security and the National Security Agency have jointly designated PNW as a National Center of Academic Excellence (CAE) in Cyber Defense Education for its B.S. in Computer Information Technology.

- It will be delivered by the faculty who have strong background and years of experience in offering cybersecurity education and workforce training through federal grants.

- The faculty with appointments to teach the program courses have been active in cybersecurity education, grants, and workforce training.
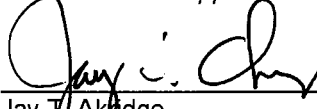
6. COMPETITIVE DEGREES – BRIEF SUMMARY

Currently, cybersecurity degrees are offered at the following Indiana higher education institutions:

- Purdue University-West Lafayette, a major in Computer and Information Technology program, with emphasis on key security concepts and combination of technical skills such as secure coding, cryptography, digital forensics and UNIX fundamentals with analytical thinking and criminology.

- Purdue Global, an online program, with emphasis on the fundamentals of cybersecurity, best practices, and IT security threats and products.

- IUPUI, with emphasis on malware analysis, intrusion detection, risk analysis and mitigation, security data analytics, and cloud and AI security.

- Indiana University Bloomington, with emphasis on programming, data structures, networked systems, and security protocols and issues of privacy, cultural, economic, legal, security, and diplomacy issues.

The proposed Bachelor of Science in Cybersecurity at PNW will be the first one in northwest Indiana, a region with the second-highest population in the state of Indiana, and the only public higher education institution that will offer four-year in-person cybersecurity education. Purdue Northwest is also the only university in the region which holds the Center of Academic Excellence in Cyber Defense Education designation. The new degree program will fill the void of cybersecurity education in the northwest part of the state, and also complement existing cybersecurity programs offered in other parts of the state.
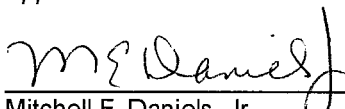
The new program is hands-on and technology-focused. Upon completion this new degree program, students will be prepared with proficient knowledges, skills, and abilities to be qualified in the following National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework job categories: Operate and Maintain, Protect and Defend, Analyze and Investigate

Recommended Approval:

_____ 3/4/22
Jay T/ Akridge   Date
Provost and Executive Vice President for
  Academic Affairs and Diversity

Approved:

_____ 3/24/22
Mitchell E. Daniels, Jr.   Date
President

Table 1
Program Financial Projection
Financial Office Table
Purdue Northwest Campus
BS Degree in Cybersecurity

	Year #1 FY 2023	Year #2 FY 2024	Year #3 FY 2025	Year #4 FY 2026	Year #5 FY 2027
I. ENROLLMENT	50	75	100	125	150
1. Program Credit Hours Generated (FTE * 30 for BS & FTE * 24 for masters/graduate)					
a. Existing Courses	900	1350	1800	2250	2700
b. New Courses					
Total	**900**	**1350**	**1800**	**2250**	**2700**
2. Full-Time Equivalents (FTE)					
a. Full-Time FTEs	30	45	60	75	90
b. Part-Time FTEs					
Total Full/Part-Time FTE	**30**	**45**	**60**	**75**	**90**
c. On-Campus Transfer FTEs	45	15	10	10	10
d. New-to-Campus FTEs	5	30	50	75	90
Total On/New-to-Campus FTE	**50**	**45**	**60**	**85**	**100**
3. Program Majors - Headcount					
a. Full-Time Students	45	68	90	113	135
b. Part-Time Students	5	7	10	12	15
Total Full/Part-Time HC	**50**	**75**	**100**	**125**	**150**
c. In-State	45	65	85	97	115
d. Out-of-State	5	10	15	28	35
Total In/Out of State HC	**50**	**75**	**100**	**125**	**150**

Notes

For both undergraduate and graduate degree enrollment projections, please carefully consider competitive degree enrollments and how the Purdue program will be marketed in the calculation of enrollment and degree completion projections.

^ Enter footnotes in the last section of this table for to provide additional details (required for 'other' categories) and projection and/or calculation logic.

Table 1
Program Financial Projection
Financial Office Table
Purdue Northwest Campus
BS Degree in Cybersecurity

	Year #1 FY 2023	Year #2 FY 2024	Year #3 FY 2025	Year #4 FY 2026	Year #5 FY 2027
II. INCREMENTAL REVENUE					
1. Projected # of *New* Students [1]	5	30	50	75	90
2. General Tuition & Fees [2]					
a. General Service	8,057	8,174	8,382	8,550	8,721
b. Technology Fee					
c. Repair & Rehabilitation Fee					
d. Student Fitness & Wellness Fee					
e. Student Activity Fee					
Total General Service T&F	$ 8,057	$ 8,174	$ 8,382	$ 8,550	$ 8,721
2. Additional Fees - *if applicable* [3]					
a. Differential Fees	539	550	561	572	583
b. Course Fees					
c. Other Fees (Lab)	71	73	74	76	77
Total Additional Fees	$ 610	$ 623	$ 635	$ 648	$ 660
Total Incremental Revenue	$ 43,336	$ 263,885	$ 450,856	$ 689,826	$ 844,307

Notes

(1) New Students represents the anticipated number of *new* students to campus; transfers or existing students are ***not*** to be included. The Total is set equal to the 'New-to-Campus FTEs' completed in the Enrollment section (I2d).

(2) T&F must match approved Bursar rates (refer to Bursar website). The calculation should be based on the ***Full-Time/ Resident*** Student T&F. If the new degree program is primarily Part-Time students, then the T&F needs to be adjusted appropriately for this type of expected enrollment.

(3) If additional fees are applicable, then each fee must be individually listed above and match approved Bursar rates (refer to Bursar website).

Bursar T&F Website: https://www.purdue.edu/bursar/tuition/index.html

^ Enter footnotes in the last section of this table for to provide additional details (required for 'other' categories) and projection and/or calculation logic.

Table 1
Program Financial Projection
Financial Office Table
Purdue Northwest Campus
BS Degree in Cybersecurity

III. EXPENDITURES	Year #1 FY 2023 FTE	Year #1 FY 2023 Cost	Year #2 FY 2024 FTE	Year #2 FY 2024 Cost	Year #3 FY 2025 FTE	Year #3 FY 2025 Cost	Year #4 FY 2026 FTE	Year #4 FY 2026 Cost	Year #5 FY 2027 FTE	Year #5 FY 2027 Cost
1. Salary and Wages										
a. Faculty	3.00	316,638	3.00	322,971	3.00	329,430	3.00	336,019	3.00	342,739
b. Limited Term Lecturers	1.00	72,705	1.00	72,705	1.00	72,705	1.00	72,705	1.00	72,705
c. Graduate Students										
d. Other (Post Doc/Staff)	0.50	26,160	0.50	26,683	0.50	27,217	0.50	27,761	0.50	28,316
Total S&W	**4.50**	**$ 415,503**	**4.50**	**$ 422,359**	**4.50**	**$ 429,352**	**4.50**	**$ 436,485**	**4.50**	**$ 443,760**
2. Fringes and Fee Remissions										
a. Fringe Benefits		120,601		122,795		125,033		127,315		129,643
b. Fee Remissions										
Total FB & FR		**$ 120,601**		**$ 122,795**		**$ 125,033**		**$ 127,315**		**$ 107,526**
3. Supplies and Expenses										
a. General Supplies & Expenses		500		1,000		1,500		2,000		2,500
b. Minor Equipment										
c. Recruiting & Marketing										
d. Travel & Entertainment		2,000		2,000		2,000		2,000		2,000
e. Other (Library, subscriptions, IT)		3,000		3,000		3,000		3,000		3,000
Total Supplies and Expense		**$ 5,500**		**$ 6,000**		**$ 6,500**		**$ 7,000**		**$ 7,500**
4. Capital										
a. Capitalized Equipment										
b. Repair & Replacement										
Total Equipment		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
Total Expenditures		**$ 541,604**		**$ 551,154**		**$ 560,885**		**$ 570,800**		**$ 558,786**
Projected Program Surplus/(Deficit)*		**$ (498,268)**		**$ (287,270)**		**$ (110,029)**		**$ 119,026**		**$ 285,521**

* For the CHE proposal, only identify the nature of the support. It is not necessary to note dollars in the report; however, it should be stated that there is sufficient revenue to cover expenses.

Projected surplus/deficit is an aid to identify potential new University revenue, anticipated program costs, and degree substantiality. This does not represent any type of funding request.
^ Enter footnotes in the last section of this table for to provide additional details (required for 'other' categories) and projection and/or calculation logic.

Table 1
Program Financial Projection
Financial Office Table
Purdue Northwest Campus
BS Degree in Cybersecurity

FOOTNOTES

I. Enrollment Details
1. Program Credit Hours Generated

2. Full-Time Equivalents (FTE)

3. Program Majors - Headcount
   Currently 76 students are in Cybersecurity Concentration which will be eleminated after this degree program has been approved. We anticipate that all the concentration students will be either graduated or switch to the degree program.

II. Incremental Revenue Details
1. Projected # of New Students

2. General Tuition & Fees   Assumes a annual 2.0% tuition and fee increases

3. Additional Fees - if applicable

III. Expenditure Details
1. Salary and Wages   Average Faculty Salary = $105K   Average CL salary = $72K

2. Fringes and Fee Remissions

3. Supplies and Expenses

4. Capital

Table 2
Program Revenue and Expenditure Summary
Board of Trustees Table
Purdue Northwest Campus
BS Degree in Cybersecurity

	Year #1 FY 2023	Year #2 FY 2024	Year #3 FY 2025	Year #4 FY 2026	Year #5 FY 2027
Total Incremental Revenue*	$ 43,336	$ 263,885	$ 450,856	$ 689,826	$ 844,307
Total Expenditures	$ 541,604	$ 551,154	$ 560,885	$ 570,800	$ 558,786
Projected Program Surplus/(Deficit)**	$ (498,268)	$ (287,270)	$ (110,029)	$ 119,026	$ 285,521

*Based on the anticipated number of **new** students to campus; transfers or existing students are not included. Projected incremental revenue is based on the current **full-time, resident** tuition and fees approved by the Bursar.

**Projected surplus/deficit is an aid to identify potential new University revenue, anticipated program costs, and degree substantiality. This does not represent any type of funding request.

Additional Departmental Footnotes:

Table 3
Projected Headcount and FTE Enrollment and Degrees Conferred
Board of Trustees & ICHE Table
Purdue Northwest Campus
BS Degree in Cybersecurity

	Year #1 FY 2023	Year #2 FY 2024	Year #3 FY 2025	Year #4 FY 2026	Year #5 FY 2027
Enrollment Projections (Headcount)	50	75	100	125	150
Enrollment Projections (FTE)	30	45	60	75	90
Degree Completions Projection	15	20	25	30	35