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: **August 24, 2020**
TO: Board of Trustees
FROM: Feng Li, Primary Contact, (317) 278-9750; fengli@iupui.edu
CC: Karen Alfrey, Secondary Contact, (317) 278-2261; kalfrey@iupui.edu
SUBJECT: BS in Cybersecurity

CAMPUS OFFERING DEGREE: IUPUI

ANTICIPATED START DATE: Fall 2021

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 proposed BS in Cybersecurity supports IUPUI's mission to "advance the state of Indiana and the intellectual growth of its citizens to the highest levels nationally and internationally through research and creative activity, teaching and learning, and civic engagement." This cybersecurity degree program will prepare students for the diverse and ever changing field of cybersecurity by focusing on high-impact learning experiences, integration of cybersecurity with multiple disciplines, experiential learning, the development of critical thinking, and translating research into professional practice. Further, this degree will serve "the greater Indianapolis metropolitan area, the State of Indiana, and the nation by providing a high-quality experiential learning environment" in accord with the School of Engineering and Technology's mission.

This program will differ from programs at Purdue West Lafayette and Indiana University Bloomington, as our focus is to provide an undergraduate program that will address local industry needs by delivering hands-on cybersecurity courses, many with lab components, and to complement these hands-on lab courses with courses that have a significant engineering influence. Though it is well known that cybersecurity plays an important role in the IT area, we see numerous threats and vulnerabilities in manufacturing, power/utilities, automotive, health engineering, agriculture, and many more. This degree will prepare graduates to address those vulnerabilities, meeting a crucial need for the employers of those graduates.

According to the 2019 Ponemon Data Breach Report[1], the cost of a data breach in the United States rose to $8.19 million, with the time to identify and contain the breach at 279 days. Additionally, Ponemon stated malicious breaches are the most common at over 50%. The need to educate and train the workforce in Indiana is reaching a critical mass. Companies must have the expertise to secure their data and infrastructure as well as educate employees on the importance of protecting data. Indianapolis area has seen the growth of Cybersecurity and Information Assurance related companies in recent years. In addition to the existing big health related companies such as Lilly and Anthem, there have been more technological oriented companies expanding in the central Indiana region (e.g., Genesys, Salesforce, etc.) and some major corporations such as Pondurance, Simon Property Group, LLC., and Infosys. All of these companies will need to hire workers with knowledge intensive skill sets. Moreover, concerns of

[1] Ponemon, L. (2017). 2017 Ponemon Institute cost of a data breach study. Available online at: https://www.ibm.com/security/data-breach

security are no longer limited to IT related companies; the need to monitor and adhere to good cybersecurity principles is pervasive not just in IT, but engineering, health, automotive, manufacturing, etc.

The cybersecurity degree will utilize existing undergraduate courses offered by CIGT with other courses from four Departments, including Computer Information Graphics Technology (CIGT), Electrical & Computer Engineering (ECE), Computer and Information Sciences (CIS), and Informatics. Additionally, complimentary topics in O'Neill School of Public Affairs, Law, Liberal Arts, School of Science, and School of Engineering and Technology, will be utilized, as cybersecurity is a multi-disciplinary field of study.

CIGT, Computer Information Technology (CIT) program specifically, has long been a leader in the delivery of cybersecurity curriculum, presenting its first class offerings in 2004. The existing cybersecurity program in CIT is part of the Center of Academic Excellence in Cyber Defense (CD), (CAE-CD), a distinguished designation awarded by the National Security Agency (NSA) and the Department of Homeland Security (DHS). The curriculum also maps to the National Initiative for Cybersecurity Education (NICE) lead by the National Institute of Standards and Technology (NIST) focusing on education, training and workforce development. Additionally, courses map Association for Computing Machinery (ACM) Cybersecurity Education (CSEC) 2017 curricular guidance, which a faculty member played a role in the creation. The new cybersecurity degree blends existing courses with other disciplines to create a comprehensive multi-disciplinary cybersecurity undergraduate program that will eventually open doors to all majors.

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

i) National, State, or Regional Need

In Indiana, IU Bloomington has an undergraduate Security Minor, on-campus and online, no BS. The Department of CIGT at IUPUI has a Purdue undergraduate concentration in Information Assurance and Security, which builds the foundations for the proposed BS degree in Cybersecurity. In addition, the unique profile of the IUPUI campus, its location, and the central Indiana industry needs provide the greatest rationale of why this program will succeed.

ii) Summary of Indiana Department of Workforce Development and/or U.S. Department of Labor Data

According to Bureau of Labor Statistics, Information Security Analyst jobs are projected to grow 32% from 2018 to 2028[2]. More specifically, "More than 209,000 cybersecurity jobs in the U.S. are unfilled, and postings are up 74% over the past five years, according to a 2015 analysis of numbers from the Bureau of Labor Statistics by Peninsula Press, a project of the Stanford University Journalism Program."[3] All of these institutions are represented in the Central Indiana and Indianapolis area and, therefore, the cybersecurity jobs are also expected to grow accordingly. Similar projections are made at the local level in Indiana: 10-year growth in IT Occupations is projected to be 18.3%[4].

iii) National, State, or Regional Studies

The Cyberseek Heatmap[5] shows cybersecurity professionals are currently in high demand in a wide range of industries, spanning from basic engineering to tech companies, sectors include pharmaceutical, biomedical, automotive, power/utilities, manufacturing, financial, etc.

iv) Surveys of Employers or Students and Analyses of Job Postings

A cyberseek job search reveals the high demand of skilled cybersecurity workers; for instance, a nation-wide search yielded 504,316 cybersecurity jobs with 4,553 cybersecurity job openings currently unfilled in Indiana.

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[2] https://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm

[3] https://www.forbes.com/sites/stevemorgan/2016/01/02/one-million-cybersecurity-job-openings-in-2016/

[4] http://www.hoosierdata.in.gov/FD/overview.aspx

[5] https://www.cyberseek.org/heatmap.html

4. COSTS

A. Tuition and Fees—In-state and out-of-state
In-State Tuition (full-time): $4,397.39
Out-of-State Tuition (full-time): $15,238.45
Fees (15 credit hours): $1320.61

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

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

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

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

There is one BS in Cybersecurity at Purdue West Lafayette campus. The program's goal is to help meet this need by providing a comprehensive IT education that also emphasizes key security concepts. The major's holistic approach combines skills such as secure coding, cryptography, digital forensics and UNIX fundamentals with analytical thinking and criminology.

Purdue Global offers a purely online BS Cybersecurity degree. The Purdue Global BS degree program is designed to help students master the foundational goals of cybersecurity and apply tools and methodologies to solve security problems.

Our proposed IUPUI program differs from these existing BS degree programs since it mainly targets the industry needs in the Indianapolis area, it is residential offering, and it is interdisciplinary but information-technology-centered. The program has a significant hands-on component. It will be a residential offering in the Indianapolis area and should not cause any interference with other programs in this area. It will fully utilize the existing cybersecurity courses and faculty expertise in our school and in the IUPUI campus.

6. COMPETITIVE DEGREES – BRIEF SUMMARY

Regionally there are a number of BS in Cybersecurity programs. In surrounding states they include: Depaul University, Eastern Illinois University, Illinois Institute of Technology, Illinois State University, Northwestern University, University of Illinois at Urbana-Champaign, University of Louisville, Michigan Technological University, Oakland University, Wright State University, Marquette University. Regionally, all neighboring/nearby states have multiple BS in Cybersecurity.

Nationally there are many BS in Cybersecurity degree programs.

The city of Indianapolis ranks among the top 28-to-35 populated metropolitan areas in the US (actual ranking will depend on the organization that defines the metropolitan area). Surveying a list of top 40 populated metropolitan areas, Indianapolis was the only metropolitan area that did not have a nearby (within 15 miles) BS in Cybersecurity.

Recommended Approval:

9/8/20

Jay T. Akridge — Date
Provost and Executive Vice President for
Academic Affairs and Diversity

Approved:

9/4/20

Mitchell E. Daniels, Jr. — Date
President

Table 2
Program Revenue and Expenditure Summary
Board of Trustees Table
Purdue Indianapolis Campus (IUPUI)
BS in Cybersecurity Degree in the School of Engineering and Technology

	Year #1 FY 2021	Year #2 FY 2022	Year #3 FY 2023	Year #4 FY 2024	Year #5 FY 2025
Total Incremental Revenue*	$ 79,936	$ 174,860	$ 224,820	$ 299,760	$ 374,700
Total Expenditures	$ 3,000	$ 81,000	$ 81,000	$ 81,000	$ 81,000
Projected Program Surplus/(Deficit)**	**$ 76,936**	**$ 93,860**	**$ 143,820**	**$ 218,760**	**$ 293,700**

*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 Indianapolis Campus (IUPUI)
BS in Cybersecurity Degree in the School of Engineering and Technology

	Year #1 FY 2021	Year # 2 FY 2022	Year # 3 FY 2023	Year # 4 FY 2024	Year # 5 FY 2025
Enrollment Projections (Headcount)	**25**	**47**	**69**	**91**	**113**
Enrollment Projections (FTE)	**23**	**45**	**65**	**86**	**106**
Degree Completions Projection	**0**	**37**	**55**	**72**	**90**