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: October 10, 2019
TO: Board of Trustees
FROM: *Feng Li*, Primary Contact, (317) 324-8668; fengli@iupui.edu
CC: *David J. Russomanno*, Secondary Contact, (317) 274-0802; drussoma@iupui.edu
CC: *Paul Salama*, Secondary Contact, (317) 278-1682; psalama@iupui.edu
SUBJECT: *Master of Science (M.S.) in Cybersecurity and Trusted Systems*

CAMPUS OFFERING DEGREE: Purdue Indianapolis/IUPUI

ANTICIPATED START DATE: January 2020

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 Department of Computer Information and Graphics Technology (CIGT) of the Purdue School of Engineering and Technology, IUPUI propose a Master of Science program in Cybersecurity and Trusted Systems. This program will utilize selected existing graduate courses with related, complimentary topics in Information Technology, Computer Engineering, and Computer Science, in a sequence that incrementally yields deeper understanding of different theoretical and applied methods of cybersecurity.

The objective of this program is to prepare students to enter the workforce in the rapidly advancing field of cybersecurity, to enable them to address the security challenges and risks that industries encounters daily. Cybersecurity is a multidisciplinary area: it is a combination of information technology, computing, and engineering. This degree will provide a solid, comprehensive background in the related topics of cybersecurity engineering and their applications. The goal of this degree program is to provide the student the opportunity to develop all foundational knowledge and the necessary cybersecurity skill set to prepare them for their engineering / information technology careers. In addition, students in the program can seek other technologies that can enhance their cybersecurity skills. For example, a cybersecurity engineer with strong data analytics skills can apply data analytics to problem domains to gain greater awareness of potential cybersecurity vulnerabilities.

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

According to Bureau of Labor Statistics, IT jobs are projected to grow 19% from 2016 to 2026. 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.” 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%.

Indiana University-Purdue University Indianapolis (IUPUI)’s mission includes education, research, and service to the community within Central Indiana. As part of this mission, IUPUI needs to provide educational outreach to help develop a workforce with skills and knowledge that aligns with existing industry needs and emerging job markets. Cybersecurity is one such industry need and the job market in this area has grown

significantly due to this need. Therefore, the MS in Cybersecurity and Trusted Systems degree aligns well with this IUPUI mission.

This program will differ from programs at Purdue West Lafayette and Indiana University Bloomington, as our focus is to provide a graduate 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 the cybersecurity plays an important role in the IT area, we see numerous threats and vulnerabilities in manufacturing, power/utilities, automotive, health engineering, and many more. A program with such a focus needs to be located near industry and on-line programs cannot address engineering industry needs.

Currently, IUPUI has a concentration within the department in this area. Thus, this degree regroups existing courses and utilizes existing faculty to create a master's degree. No new faculty and, at this time, no new courses are needed to deliver the program.

The attention and need of cybersecurity has been rapidly increasing. Indiana and, in particular, 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 startups such as High Alpha. All of these companies will need to hire workers with knowledge intensive skill sets. Moreover, concerns of security is 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. sectors.

4. COSTS

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

In-state estimation: 9 credit hours/semester

In-State Grad Tuition: ($412.00 x 9 hrs)	$3,708.00
General Fee	$200.13
Repair & Rehabilitation Fee($14.50 x 9 hrs)	$130.50
Technology Fee	$186.55
Total:	**$4,225.18**

Out-of-state: 9 credit hours/semester

Out-of-State Grad Tuition($1,250.00 x 9 hrs)	$11,250.00
General Fee	$200.13
Repair & Rehabilitation Fee($14.50 x 9 hrs)	$130.50
Technology Fee	$186.55
Total:	**$11,767.18**

B. Financial Projection Table
See Table 1

C. Program Review and Expenditure Summary
See Table 2

D. Enrollment Projection
See Table 3

Table 1
Program Financial Projection
Financial Office Table
Purdue Indianapolis Campus/IUPUI
Master of Science Degree in Cybersecurity and Trusted Systems

	Year #1 FY 2020	Year #2 FY 2021	Year #3 FY 2022	Year #4 FY 2023	Year #5 FY 2024
I. ENROLLMENT					
1. Program Credit Hours Generated (FTE * 30 for BS & FTE * 24 for masters/graduate)					
a. Existing Courses	456	768	1008	1176	1344
b. New Courses	0	0	0	0	0
Total	**456**	**768**	**1008**	**1176**	**1344**
2. Full-Time Equivalents (FTE)					
a. Full-Time FTEs	18	28	36	42	50
b. Part-Time FTEs	1	4	6	7	6
Total Full/Part-Time FTE	**19**	**32**	**42**	**49**	**56**
c. On-Campus Transfer FTEs	8	11	21	21	28
d. New-to-Campus FTEs	11	21	21	28	28
Total On/New-to-Campus FTE	**19**	**32**	**42**	**49**	**56**
3. Program Majors - Headcount					
a. Full-Time Students	18	28	36	42	50
b. Part-Time Students	2	8	12	13	12
Total Full/Part-Time HC	**20**	**36**	**48**	**55**	**62**
c. In-State	10	22	30	36	42
d. Out-of-State	10	16	18	19	20
Total In/Out of State HC	**20**	**38**	**48**	**55**	**62**

	Year #1 FY 2020	Year #2 FY 2021	Year #3 FY 2022	Year #4 FY 2023	Year #5 FY 2024
II. INCREMENTAL REVENUE					
1. Projected # of *New* Students [(1)]	11	21	21	28	28
2. General Tuition & Fees [(2)]					
a. In-state Tuition	3,708	3,708	3,708	3,708	3,708
b. Technology Fee	187	187	187	187	187
c. Repair & Rehabilitation Fee	131	131	131	131	131
d. General Fee	200	200	200	200	200
e. Student Activity Fee	-	-	-	-	-
Total General Service T&F	**$ 4,225**	**$ 4,225**	**$ 4,225**	**$ 4,225**	**$ 4,225**
2. Additional Fees - *if applicable* [(3)]					
a. Differential Fees					
b. Course Fees					
c. Other Fees					
Total Additional Fees	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Total Incremental Revenue	**$ 46,477**	**$ 88,729**	**$ 88,729**	**$ 118,305**	**$ 118,305**
	Year #1	**Year #2**	**Year #3**	**Year #4**	**Year #5**

Table 1
Program Financial Projection
Financial Office Table
Purdue Indianapolis Campus/IUPUI
Master of Science Degree in Cybersecurity and Trusted Systems

	FY 2020		FY 2021		FY 2022		FY 2023		FY 2024	
III. EXPENDITURES										
1. Salary and Wages	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**
a. Faculty	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-
b. Limited Term Lecturers	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-
c. Graduate Students	3.00	43,000	4.00	60,000	4.00	60,000	4.00	60,000	4.00	60,000
d. Other (Post Doc/Staff)	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-
Total S&W	**3.00**	**$ 43,000**	**4.00**	**$ 60,000**	**4.00**	**$ 60,000**	**4.00**	**$ 60,000**	**4.00**	**$ 60,000**
2. Fringes and Fee Remissions										
a. Fringe Benefits		-		-		-		-		-
b. Fee Remissions		-		-		-		-		-
Total FB & FR		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
3. Supplies and Expenses										
a. General Supplies & Expenses		-		-		-		-		-
b. Minor Equipment		-		-		-		-		-
c. Recruiting & Marketing		3,000		3,000		3,000		3,000		3,000
d. Travel & Entertainment		-		-		-		-		-
e. Other (Library, subscriptions, IT)		-		-		-		-		-
Total Supplies and Expense		**$ 3,000**		**$ 3,000**		**$ 3,000**		**$ 3,000**		**$ 3,000**
4. Capital										
a. Capitalized Equipment										
b. Repair & Replacement										
Total Equipment		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
Total Expenditures		**$ 46,000**		**$ 63,000**		**$ 63,000**		**$ 63,000**		**$ 63,000**
Projected Program Surplus/(Deficit)*		**$ 477**		**$ 25,729**		**$ 25,729**		**$ 55,305**		**$ 55,305**

***** 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 Indianapolis Campus/IUPUI
Master of Science Degree in Cybersecurity and Trusted Systems

FOOTNOTES

I. Enrollment Details

1. Program Credit Hours Generated
2. Full-Time Equivalents (FTE)
3. Program Majors - Headcount

II. Incremental Revenue Details

1. Projected # of New Students
2. General Tuition & Fees
3. Additional Fees - if applicable

III. Expenditure Details

1. Salary and Wages
2. Fringes and Fee Remissions
3. Supplies and Expenses
4. Capital

Table 2
Program Revenue and Expenditure Summary
Board of Trustees Table
Purdue Indianapolis Campus/IUPUI
Master of Science Degree in Cybersecurity and Trusted Systems

	Year #1 FY 2020	Year #2 FY 2021	Year #3 FY 2022	Year #4 FY 2023	Year #5 FY 2024
Total Incremental Revenue*	$ 46,477	$ 88,729	$ 88,729	$ 118,305	$ 118,305
Total Expenditures	$ 46,000	$ 63,000	$ 63,000	$ 63,000	$ 63,000
Projected Program Surplus/(Deficit)**	**$ 477**	**$ 25,729**	**$ 25,729**	**$ 55,305**	**$ 55,305**

*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.

Table 3					
Projected Headcount and FTE Enrollment and Degrees Conferred					
Board of Trustees & ICHE Table					
Purdue Indianapolis Campus/IUPUI					
Master of Science Degree in Cybersecurity and Trusted Systems					
	Year #1	**Year # 2**	**Year # 3**	**Year # 4**	**Year # 5**
	FY 2020	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Enrollment Projections (Headcount)	**20**	**36**	**48**	**55**	**62**
Enrollment Projections (FTE)	**19**	**32**	**42**	**49**	**56**
Degree Completions Projection	**0**	**19**	**21**	**26**	**30**

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

There is one Interdisciplinary Masters' Program in Information Security in Purdue West Lafayette campus. The graduation is handled by a participating department of the student's choice. There are a number of possible final degree for the students: 1). MA for students who receive the degree from the Department of Philosophy; 2). MA or MS for students who receive the degree from the Department of Communication; 3). MS for students who receive the degree from the College of Technology; 4). MA for students graduated by the Department of Linguistics.

There is one Professional Masters Degree in Information Security (ISCP) in the computer science department at Purdue West Lafayette campus. This degree program is designed for IT professionals in industry or government who want to advance in technical cybersecurity and privacy positions. The program is intended to serve professionals with programming and computer science experience acquired either during their professional career or by having at least an undergraduate CS minor.

Purdue Global offers a purely online Master Cybersecurity Management degree program. The Purdue Global's master's degree program is designed to prepare students for leadership roles directing and protecting critical information infrastructures. The students will study how to develop, implement, evaluate, and update the security policies and practices that help organizations respond effectively to cyber attacks. The graduates from the Master Cybersecurity Management degree program are expected to be skilled in the management of information continuity, asset clarification and control, compliance management, incident response, and secure administration of information systems.

Our proposed IUPUI program differs from these existing MS 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 and the Cybersecurity Engineering is the main technical theme of the program. 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

There are no existing MS programs at Indiana University Purdue University Indianapolis in the Cybersecurity area. We have discussed and obtained supporting letters from related units from IUB and PUWL. The new degree program will focus on residential offering for the Indianapolis area.

Recommended Approval:

9/14/19

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

Approved:

9/12/19

Mitchell E. Daniels, Jr. Date
President