BOARD APPROVED
APRIL 5, 2024

Cindy Ream
Corporate Secretary

PURDUE UNIVERSITY BOARD OF TRUSTEES
EXECUTIVE SUMMARY DEGREE PROPOSAL TEMPLATE

PLEASE NOTE THAT THE FULL ACADEMIC DEGREE PROGRAM SUBMISSION DOCUMENT WILL NEED TO BE COMPLETED FOR THE INDIANA COMMISSION ON HIGHER EDUCATION (see https://www.in.gov/che/academic-affairs/academic-degree-programs/). Both this template and the Academic Degree Program Submission are submitted to the Purdue Board of Trustees. When this form is complete, please save and return to sdunk@purdue.edu with tables as separate attachments.

DATE: February 6, 2024
TO: Board of Trustees
FROM: Carrie Berger, carrieb@purdue.edu; Dimitros Peroulis, dperouli@purdue.edu

SUBJECT: MS Data Science

CAMPUS OFFERING DEGREE: Purdue West Lafayette

ANTICIPATED START DATE: Spring, 2025

1. IS THE DEGREE RESIDENTIAL, HYBRID, OR ONLINE?

IF ONLINE, RATIONALE FOR GOING THROUGH SPECIFIC PURDUE CAMPUS—PWL, PFW, PNW, PG

This proposed interdisciplinary degree will be offered fully online through the PWL campus and will be supported administratively by Purdue University Online.

Proposed Degree: MS in Data Science

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

The Online Master's Degree in Data Science (OMSDS) is a technical degree designed to meet the needs of working professionals who have some or no formal training in data science. Students with a technical B.S. degree and meeting Graduate School minimum requirements may apply and be admitted directly into the program. Industrious students who do not have formal training in data science, computer science, or engineering but have taken it upon themselves to be prepared for this program may earn their acceptance through an alternate pathway. Students may enroll in 2 OMSDS courses for non-credit (Foundations in Data Science; Machine Learning and Data Mining) to explore the program. Students receiving at least a B in these courses may matriculate directly into the degree program upon payment of a credit transfer fee (the difference between non-credit and for-credit tuition) and the completed courses will apply toward the degree. Once accepted into the program, students will learn using real-world data sets collected and curated by Purdue University and by working on industry-provided project teams through The Data Mine.

This program meets the needs of industry-aligned data scientists by providing foundational coursework in the Foundations of Data Science; Machine Learning and Data Mining; Big Data Technologies and Tools; Data Analysis, Data Visualization, and Communication. To tailor their needs and provide an opportunity to learn cutting-edge techniques, technologies, and applications, students will select an industry-aligned certificate pathway. Initial certificate options include Digital Humanities, Spatial Data Science, Managing Information Technology Projects, Information Technology Business Analysis, Applied Data Analytics, Government, Policy, Non-Profit, Pharmaceutical Data Science, and Smart Manufacturing. All students will complete a capstone project to apply their understanding of Data Science to a real-world project. Students will also have a wide range of interdisciplinary electives to round out their curriculum.

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

The Online Master's in Data Science is designed to meet regional, state, and national labor market needs. Nationally, there have been nearly 125,000 Data Scientist jobs added in the United States, representing a growth of 275% from 2013-2023 and the labor market is expected to continue to grow (Lightcast, 2024). Approximately 15% of Data Scientists work in the State Government. According to Building Indiana Business (2024), there have been over $7Billion in tech-based acquisitions Indiana and positions are expected to grow by an additional 3% in 2024.

According to the 2023 TechPoint Tech Workforce Report, technology talent demand is at a record point for Indiana and continues to grow. "Digital transformation and automation across all sectors of the Indiana economy make skilled tech talent a foundational driver of current and future economic growth and employment and an essential part of the statewide workforce, including advanced manufacturing, agriculture, healthcare, life sciences, and logistics sectors." Further, and importantly, the supply of data scientists is not meeting demand. Data Science postings are growing while hiring remains flat; traditional talent pipelines are not meeting Indiana's needs. An additional challenge is that 1500 Hoosiers are working remotely for companies headquartered outside the State of Indiana.

Purdue University is poised to meet these challenges by forging strong business partnerships with Indiana-based companies to attract and retain qualified talent in the State of Indiana. Because technology companies contribute $51Billion to Indiana's Gross Domestic Product, it is of critical importance that business-to-college partnerships provide opportunities for qualified Hoosiers to work for Indiana companies in a field where there are more available job postings than there are people who can fill them.

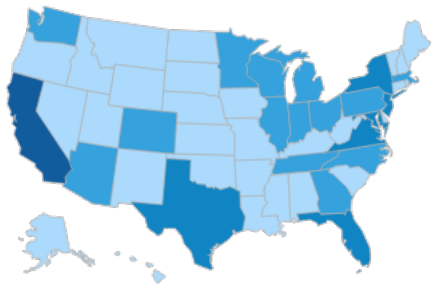

Figure 1. Regional breakdown of Data Scientist jobs by region. Indiana and the Midwest are areas of high activity (Lightcast, 2024). The darker blue colors indicate high regions of Artificial Intelligence activity.

4. COSTS

A. Tuition and Fees—In-state and out-of-state
   a. In-state: $933.33/credit hour
   b. Out-of-state: $933.33/credit hour

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

Purdue University is launching a new fully online MS Artificial Intelligence program. Additionally, Purdue University Daniels School of Business offers a top-ranked MS in Business Analytics that is expected to complement the MS Data Science program. Purdue University offers Top-10-ranked undergraduate Computer Science programs that will prepare students to continue their education in the fully online MS Data Science program. Additionally, existing undergraduate programs in Engineering, Management, and Science complement the nascent degree. We hope to create pipelines of students to admit into the OMSDS program to attract and retain Indiana students.

6. COMPETITIVE DEGREES – BRIEF SUMMARY

Completions by Institution

Institution	Master's Degree Completions (2022)	Growth % YOY (2022)	Market Share (2022)	IPEDS Tuition & Fees (2022)	Completions Trend (2018-2022)
Eastern University	153	Insf. Data	12.7%	$36,464	
Columbia University in the City of New York	150	Insf. Data	12.4%	$65,508	
Bellevue University	134	Insf. Data	11.1%	$8,790	
University of Virginia-Main Campus	101	Insf. Data	8.4%	$21,425	
Maryville University of Saint Louis	85	214.8%	7.0%	$27,166	
New Jersey Institute of Technology	71	Insf. Data	5.9%	$18,512	
Texas Tech University	69	4.5%	5.7%	$11,852	
Worcester Polytechnic Institute	42	Insf. Data	3.5%	$56,896	
University of Michigan-Ann Arbor	39	Insf. Data	3.2%	$17,786	
University of the Pacific	31	-38.0%	2.6%	$53,682	
University of Wisconsin-La Crosse	29	0.0%	2.4%	$9,232	
University of Wisconsin-Eau Claire	28	-3.4%	2.3%	$8,914	
University of California-Santa Barbara	25	Insf. Data	2.1%	$14,617	

Table 1. Top competitors using the MS Data Science CIP (30.7001). (Lightcast, 2024).

Recommended Approval:

3/6/2024

Patrick J. Wolfe, Ph.D. — Date
Provost and Executive Vice President for Academic Affairs and Diversity
Miller Family Professor of Statistics and Computer Science

Approved:

3.19.2024

Mung Chiang, Ph.D. — Date
President
Roscoe H. George Distinguished Professor of Electrical and Computer Engineering

Table 1
Program Financial Projection
Financial Office Table
Purdue West Lafayette
MS in Data Science (Graduate School)

	Year #1 FY 2025	Year #2 FY 2026	Year #3 FY 2027	Year #4 FY 2028	Year #5 FY 2029
I. ENROLLMENT					
1. Program Credit Hours Generated (FTE * 30 for BS & FTE * 24 for masters/graduate)**. We used 18 credit hours for this calculation.**					
a. Existing Courses	970	2375	2915	3350	3510
b. New Courses	650	1585	1945	2230	2340
Total	**1620**	**3960**	**4860**	**5580**	**5850**
2. Full-Time Equivalents (FTE)					
a. Full-Time FTEs	0	0	0	0	0
b. Part-Time FTEs	70	165	205	235	245
Total Full/Part-Time FTE	**70**	**165**	**205**	**235**	**245**
c. On-Campus Transfer FTEs	0	0	0	0	0
d. New-to-Campus FTEs	70	165	205	235	245
Total On/New-to-Campus FTE	**70**	**165**	**205**	**235**	**245**
3. Program Majors - Headcount					
a. Full-Time Students	0	0	0	0	0
b. Part-Time Students	70	165	205	235	245
Total Full/Part-Time HC	**70**	**165**	**205**	**235**	**245**
c. In-State	18	41	55	65	75
d. Out-of-State	52	124	150	170	170
Total In/Out of State HC	**70**	**165**	**205**	**235**	**245**

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 West Lafayette
MS in Data Science (Graduate School)

		Year #1 FY 2025	Year #2 FY 2026	Year #3 FY 2027	Year #4 FY 2028	Year #5 FY 2029
II. INCREMENTAL REVENUE						
1. Projected # of *New* Students [1]		70	165	205	235	245
2. General Tuition & Fees [2]						
a. General Service	$933/CR	$ 1,511,460	$ 3,694,680	$ 4,534,380	$ 5,206,140	$ 5,458,050
b. Purdue Online Infrastructure Fee	$18.80/CR	$ 30,456	$ 74,448	$ 91,368	$ 104,904	$ 109,980
c. Digital Education Fee	$50/CR	$ 81,000	$ 198,000	$ 243,000	$ 279,000	$ 292,500
d. Facilities and Administration	$93/CR	$ 150,660	$ 368,280	$ 451,980	$ 518,940	$ 544,050
Total General Service T&F		**$ 1,773,576**	**$ 4,335,408**	**$ 5,320,728**	**$ 6,108,984**	**$ 6,404,580**
2. Additional Fees - *if applicable* [3]						
a. Differential Fees		-	-	-	-	-
b. Course Fees		-	-	-	-	-
c. Other Fees		-	-	-	-	-
Total Additional Fees		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Total Incremental Revenue		**$ 1,773,576**	**$ 4,335,408**	**$ 5,320,728**	**$ 6,108,984**	**$ 6,404,580**

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 West Lafayette
MS in Data Science (Graduate School)

	Year #1 FY 2025		Year #2 FY 2026		Year #3 FY 2027		Year #4 FY 2028		Year #5 FY 2029	
III. EXPENDITURES										
1. Salary and Wages	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**
a. Faculty		243,000		594,000		729,000		837,000		877,500
b. Limited Term Lecturers		-		-		-		-		0
c. Graduate Students		170,100		415,800		510,300		585,900		614,250
d. Other (Post Doc/Staff)		-		-		-		-		-
Total S&W	**0.00**	**$ 413,100**	**0.00**	**$ 1,009,800**	**0.00**	**$ 1,239,300**	**0.00**	**$ 1,422,900**	**0.00**	**$ 1,491,750**
2. Fringes and Fee Remissions										
a. Fringe Benefits		-		-		-		-		-
b. Fee Remissions		-		-		-		-		-
Total FB & FR		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
3. Supplies and Expenses										
a. General Supplies & Expenses (Course Produc		184,100		180,612		180,612		180,612		180,612
b. Minor Equipment		-		-		-		-		-
c. Recruiting, Marketing, & Student Support)		1,500,000		1,500,000		1,500,000		1,500,000		1,500,000
d. Travel & Entertainment		-		-		-		-		-
e. Other (Library, subscriptions, IT)		-		-		-		-		-
Total Supplies and Expense		**$ 1,684,100**		**$ 1,680,612**		**$ 1,680,612**		**$ 1,680,612**		**$ 1,680,612**
4. Capital										
a. Capitalized Equipment										
b. Repair & Replacement										
Total Equipment		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
Total Expenditures		**$ 2,097,200**		**$ 2,690,412**		**$ 2,919,912**		**$ 3,103,512**		**$ 3,172,362**
Projected Program Surplus/(Deficit)*		**$ (323,624)**		**$ 1,644,996**		**$ 2,400,816**		**$ 3,005,472**		**$ 3,232,218**

***** 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 West Lafayette
MS in Data Science (Graduate School)

Table 1
Program Financial Projection
Financial Office Table
Purdue West Lafayette
MS in Data Science (Graduate School)

FOOTNOTES

I. Enrollment Details

1.	Program Credit Hours Generated	Used 18 CR per student per year. Assumed 40% new courses (7.2 credits) and 60% existing (10.8 credits).
2.	Full-Time Equivalents (FTE)	No students are FTEs, all will be part-time.
3.	Program Majors - Headcount	All students are program majors.

II. Incremental Revenue Details

1.	Projected # of New Students	Based on competitive benchmarking (Lightcast, 2023) and existing similar program enrollments (Statistics, Engineering, Management) when the pr
2.	General Tuition & Fees	Total average tuition is $933.33 per credit hour inclusive of all fees.
3.	Additional Fees - if applicable	None

III. Expenditure Details

1.	Salary and Wages	Based on $150/CR for faculty and $105/CR for TAs. This rate includes fringe. No new faculty hires are required to launch this program.
2.	Fringes and Fee Remissions	Does not apply.
3.	Supplies and Expenses	Includes course development, marketing, recruiting, and student support.
4.	Capital	No additional capital is needed.

Table 2
Program Revenue and Expenditure Summary
Board of Trustees Table
Purdue West Lafayette
MS in Data Science (Graduate School)

	Year #1 FY 2025	Year #2 FY 2026	Year #3 FY 2027	Year #4 FY 2028	Year #5 FY 2029
Total Incremental Revenue*	$ 1,773,576	$ 4,335,408	$ 5,320,728	$ 6,108,984	$ 6,404,580
Total Expenditures	$ 2,097,200	$ 2,690,412	$ 2,919,912	$ 3,103,512	$ 3,172,362
Projected Program Surplus/(Deficit)**	**$ (323,624)**	**$ 1,644,996**	**$ 2,400,816**	**$ 3,005,472**	**$ 3,232,218**

*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 West Lafayette
MS in Data Science (Graduate School)

	Year #1 FY 2025	Year # 2 FY 2026	Year # 3 FY 2027	Year # 4 FY 2028	Year # 5 FY 2029
Enrollment Projections (Headcount)	**70**	**165**	**205**	**235**	**245**
Enrollment Projections (FTE)	**70**	**165**	**205**	**235**	**245**
Degree Completions Projection	**0**	**70**	**165**	**205**	**235**