

**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 attachment.

DATE: July 9, 2026
TO: Board of Trustees
FROM: Janice Evans, Associate Dean for College Initiatives and Graduate Education, College of Science
CC: Lucy Flesch, Frederick L. Hovde Dean, College of Science; Xiao Wang, Department Head and J.O. Berger and M.E. Bock Professor of Statistics
SUBJECT: **Master of Science in Multidisciplinary Quantitative Sciences**

CAMPUS OFFERING DEGREE: Indianapolis

ANTICIPATED START DATE: Fall 2027

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

Residential

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

Indiana's and the nation's industries increasingly need professionals with integrated expertise in statistics, data analysis, artificial intelligence, machine learning, and quantitative modeling to drive data-informed innovation across sectors such as manufacturing, finance, and technology. The **Master of Science in Multidisciplinary Quantitative Sciences** in Purdue's College of Science uniquely meets this demand. The program's structure of offering multiple majors within one program allows students to gain both depth in a chosen domain and breadth across complementary quantitative disciplines. By combining rigorous training with applied, cross-sector skills, the program will strengthen Indiana's talent pipeline for smart manufacturing, digital transformation, and analytics-driven decision-making. This program encompasses multiple majors (Data Science; Applied Statistics; and Quantitative Finance, Insurance, and Risk Management), building from a core in statistical, computing, and quantitative sciences, with a blend of topics that emphasize data, modeling, and computation.

The Master of Science in Multidisciplinary Quantitative Sciences program aligns with several of Purdue University's strategic priorities:

- Establishing this master's program in Indianapolis supports the strategic pillar of Purdue University in Indianapolis.
- The MS major in Applied Statistics, with its focus on clinical trials analyses, aligns with Purdue University's One Health strategic Initiative, endorsed by the Purdue Board of Trustees in June 2024, and including partnership with Indiana's new One Health Innovation District in Indianapolis.
- The MS major in Data Science, with its opportunity for interested students to intersect with learning opportunities connected with the MS in Sport Management (both courses and experiential learning opportunities using data from sport industry partners) aligns with Indiana's and Indianapolis's standing as the "Sports Capital of the World."

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

Multiple occupations relevant to the MS in Multidisciplinary Quantitative Sciences are in the top-three categories under the Indiana Department of Workforce Development's 'Top Jobs' (<https://topjobs.dwd.in.gov/>):

- 5-Star: Data Scientists, Clinical Data Managers, Computer Systems Engineers/Architects, Management Analysts
- 4-Star: Actuaries, Bioinformatics Scientists, Financial Analysts, Financial Quantitative Analysts, Financial Risk Specialists, Market Research Analysts and Marketing Specialists, Operations Research Analysts
- 3-Star: Statisticians

The following nationwide data from the U.S. Bureau of Labor Statistics Occupational Outlook Handbook for a range of professions relevant to the MS in Multidisciplinary Quantitative Sciences indicate **very strong job outlooks for graduates of this program**:

Profession	Number of Jobs, 2024	Job Outlook, 2024-2034	Source Link
Data Science	245,900	Much faster than average (34%)	https://www.bls.gov/ooh/math/data-scientists.htm
Actuaries	33,600	Much faster than average (22%)	https://www.bls.gov/ooh/math/actuaries.htm
Management analysts	1,075,100	Much faster than average (9%)	https://www.bls.gov/ooh/business-and-financial/management-analysts.htm
Mathematicians and Statisticians	34,600	Much faster than average (8%)	https://www.bls.gov/ooh/math/mathematicians-and-statisticians.htm
Operations Research Analysts	112,100	Much faster than average (21%)	https://www.bls.gov/ooh/math/operations-research-analysts.htm
Financial analysts	429,000	Faster than average (6%)	https://www.bls.gov/ooh/business-and-financial/financial-analysts.htm

Additionally, the earning potential of graduates from this program is strong. The estimated salaries, from starting to 30 years post-graduation for the 25th, 50th, and 75th percentiles of master's-level educated individuals in Data Science (CIP Code 30.7001), Actuarial Science (CIP Code 52.1304), and Applied Statistics (CIP Code 27.06) (representing the three majors of this program), significantly exceeds the Indiana average for an individual with a master's degree, from 8% greater to 155% greater.

4. COSTS

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

The following expenses come from the Purdue University Bursar's office, for [Purdue University in Indianapolis Tuition and Fees – 2024-2025](#).

Billed through Bursar	In-state	Out-of-state
Tuition - Fulltime, academic year (two semesters)	\$11,116	\$29,918
Other expenses, not billed through Bursar		
Housing/Food	\$20,020	\$20,020
Books, Materials, Supplies, and Equipment	\$700	\$700
Transportation	\$180	\$180
Miscellaneous and Federal Loan Fees (will vary by type of loan)	\$2,500	\$2,500
Annual total	\$34,516	\$53,318

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)

Master's Degree Enrollment Projections	7-Year "RAMP-UP PERIOD"							8 th FY
	1 st FY	2 nd FY	3 rd FY	4 th FY	5 th FY	6 th FY	7 th FY	
	2027-8	2028-9	2029-30	2030-1	2031-2	2032-3	2033-4	2034-5
Enrollment Projections (Headcount)								
Full-time	18	27	32	36	36	45	45	45
Part-time	2	3	3	4	4	5	5	5
TOTAL	20	30	35	40	40	50	50	50
Enrollment Projections (FTE)								
Full-time	18	27	32	36	36	45	45	45
Part-time	1	1.5	1.5	2	2	2.5	2.5	2.5
TOTAL	19	28.5	33.5	38	38	47.5	47.5	47.5
Degree Projections								
Degree Conferred Projection	14	21	25	29	29	36	36	36
						Three-year Average of graduates		
						36		
Projected Completion Rate: 75%								
Proposed Degree Program: M.S. in Multidisciplinary Quantitative Sciences								
CIP Code: 30.7099								

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

Similar degrees in Purdue System	Distinctive elements for this degree
Online MS in Applied Statistics Online MS in Data Science	This proposed MS differs from these: - Residential in Indianapolis - Multidisciplinary, with core courses, and then specialization courses, with one area being Applied Statistics, another being Data Science
MS in Business Analytics and Information Management MS in Business Analytics	This proposed program differs in breadth with three majors, and with heavy emphasis on statistical and computational approaches.

6. COMPETITIVE DEGREES – BRIEF SUMMARY

The table below shows programs in relevant areas/CIP codes with the three highest degree conferral numbers.

University	Degree Program	Conferrals (2024)	Tuition (2023)
UCLA	MS, Actuarial Science	89	\$13,747
Georgia State Univ.	MS, Actuarial Science	30	\$8,478
Boston University	MS, Actuarial Science	19	\$65,168
Univ. Michigan	MS, Applied Statistics	71	\$18,309
Johns Hopkins Univ.	MS, Applied Statistics	58	\$62,840
Colorado State Univ.	MS, Applied Statistics	32	\$13,009
Eastern University	MS, Data Science	664	\$37,420
University of North Texas	MS, Data Science	344	\$11,164
Columbia University	MS, Data Science	203	\$68,171
Univ. Chicago	MS, Data Analytics	246	\$65,619
Westcliff University	MS, Data Analytics	82	\$21,000
Concordia University-Saint Paul	MS, Data Analytics	68	\$25,000

Recommended Approval:

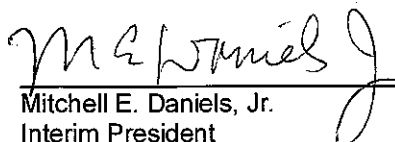


Patrick J. Wolfe, Ph.D.
Provost & Systemwide Chief Academic Officer
Miller Family Professor of Statistics and Computer Science

07/24/2026

Date

Approved:



Mitchell E. Daniels, Jr.
Interim President

7/27/26

Date

Program Financial Projection
Self-Supported Professional Graduate Programs (SSPGP)
Master of Science in Multidisciplinary Quantitative Sciences (MQS)

Cost of Program Calculation (Market Rate)⁽¹⁾

Total Program Enrollment (cap)>>>	No cap	Residency %	Rate per CH⁽¹⁾
Blended Tuition	\$24,800	Resident	20% \$324
Program Credit hours	30	Non-Resident	70% \$951
Program Credit hours per year	30	International	10% \$964
		Blended Rate >>>>	\$827

Program Incremental Revenues

	Year #1 FY 2028 (Fall 2027)	Year #2 FY 2028	Year #3 FY 2029	Year #4 FY 2030	Year #5 FY 2031
1. Enrollment/Revenue Projection					
<i>Beginning Cohort- New Students ⁽²⁾</i>	20	30	35	40	40
	-				
Total Enrollment Count	20	-	30	-	40
Total Incremental Revenue	\$ 495,992	\$ 743,988	\$ 867,986	\$ 991,984	\$ 991,984
Program Revenue held in College (70%)	\$ 347,194	\$ 520,792	\$ 607,590	\$ 694,389	\$ 694,389

Program Expenditures

	Year #1 FY 2028(Fall 2027)			Year #2 FY 2028			Year #3 FY 2029			Year #4 FY 2030			Year #5 FY 2031		
	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost	FTE
1. Salary and Wages															
a. Faculty	2.00	\$ 200,000	2.50	\$ 256,000	2.50	\$ 263,680	2.50	\$ 271,590	2.50	\$ 279,738					
b. Limited Term Lecturers	0.50	\$ 33,000	0.50	\$ 33,990	0.50	\$ 35,010	0.50	\$ 36,060	0.50	\$ 37,142					
c. Graduate Students	0.00	\$ -	0.00	\$ -	0.00	\$ -	0.00	\$ -	0.00	\$ -					
d. Other (Summer Sal)	0.00	\$ 48,000	0.00	\$ 49,440	0.00	\$ 50,923	0.00	\$ 52,451	0.00	\$ 54,024					
e. Staff	0.00	\$ -	0.00	\$ -	1.00	\$ 69,000	1.00	\$ 73,140	1.00	\$ 128,334					
Total S&W	2.50	\$ 281,000	3.00	\$ 339,430	4.00	\$ 418,613	4.00	\$ 433,241	4.00	\$ 499,239					
2. Fringes and Fee Remissions															
a. Fringe Benefits		\$ 58,500		\$ 72,255		\$ 95,123		\$ 98,597		\$ 117,455					
b. Fee Remissions		\$ -		\$ -		\$ -		\$ -		\$ -					
Total FB & FR		\$ 58,500		\$ 72,255		\$ 95,123		\$ 98,597		\$ 117,455					
3. Supplies and Expenses															
a. General Supplies & Expenses		\$ 1,500		\$ 1,500		\$ 1,500		\$ 1,500		\$ 1,500					

b. Minor Equipment	\$ -	\$ -	\$ -	\$ -	\$ -
c. Recruiting & Marketing	\$ 15,000	\$ 15,450	\$ 15,914	\$ 16,391	\$ 16,883
d. Travel & Entertainment	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750
e. Other (Library, subscriptions, IT)	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
f. Space Rental (Indianapolis only)	\$ -	\$ -	\$ -	\$ -	\$ -
Total S&E	\$ 18,250	\$ 18,700	\$ 19,164	\$ 19,641	\$ 20,133
4. Capital					
a. Capitalized Equipment	\$ -	\$ -	\$ -	\$ -	\$ -
b. Repair & Replacement	\$ -	\$ -	\$ -	\$ -	\$ -
Total Equipment	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenditures	\$ 357,750	\$ 430,385	\$ 532,900	\$ 551,480	\$ 636,827

Projected Program Surplus/(Deficit)*	\$138,242	\$313,603	\$335,086	\$440,504	\$355,157
Program Surplus/(Deficit) in College	-\$10,556	\$90,407	\$74,691	\$142,909	\$57,562

Notes

- (1) Market Rate analysis can be done per each program through the iData office. If additional assistance is needed, please work through your Business Office to complete the market rate analysis. See Appendix A for minimum's.
- (2) 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).

The following tabs are additional resources.

- **Average Salaries** is based on Spring 2025 data. This is a resource for calculating Salary costs into the financial tables.
- **Table 2 - Rev & Exp Summary** is required for submission into curriculog. It must align with the amounts listed in the financial summaries.
- **Table 3 - Enrollment projection** is required for submission into curriculog. It must align with headcount enrollment projections listed in the financial summaries.

data is based on Spring 2025 actuals. Last updated 8/1/2025

Business Area Display (All) << Select Business Area
Financial Unit Display 14050000 - Civil and Construction Engineering

Employee Class2	Career Stream Code	Sum of FTE	Average of Annual Base Salary 100 Pct Full Time
Faculty		48.40	160,250
Clinical/Research		4.25	142,781
Limited Term Lecturer		0.88	69,091
Visiting Faculty		2.00	100,000
Continuing Lecturer		3.65	105,566
Post Doc/Intern/Res		13.00	56,910
Exec/Mgmt/Prof		41.40	90,521
Support		7.00	40,878
Service		5.00	60,204
Grand Total		125.58	116,193

Financial Unit Display			
11000000 - Ag - Admin	11000600 - CES	11010000 - Agricultural Co...	11030000 - Ag Econ
11040000 - Ag & Biologica...	11050000 - Agronomy	11060000 - Animal Sciences	11070000 - Biochemistry
11080000 - Indiana State ...	11090000 - Botany & Plant...	11100000 - Field Extension	11110000 - Forestry & Nat...
11120000 - Food Science	11130000 - Ag Sciences E...	11140000 - Horticulture	11150000 - International P...
11160000 - CERIS	11170000 - Purdue Ag Ce...	11180000 - Entomology	12000000 - Vet Med - Admin
12010000 - Comparative P...	12020000 - Center for Par...	12030000 - Basic Medical ...	12040000 - Vet Clinical Sci...
12050000 - Vet Teaching ...	12060000 - Medical Educa...	12070000 - Center for Co...	12080000 - ADDL
13000000 - HHS Admin	13000700 - Public Health	13020000 - Nutrition Scien...	13030000 - Human Develo...
13040000 - Hospitality & T...	13050000 - Health & Kines...	13060000 - Health Sciences	13070000 - Nursing
13080000 - Psychological ...	13090000 - SLHS	14010000 - College of Eng...	14030000 - Aero & Astro
14040000 - Civil & Const...	14050000 - Civil & Const...	14060000 - Electrical & E...	14070000 - Environmental

Table 2
Program Revenue and Expenditure Summary
Board of Trustees Table
Purdue West Lafayette Campus

Graduate - SSPGP					
Master of Science in Multidisciplinary Quantitative Sciences (MQS)					
	Year #1	Year #2	Year #3	Year #4	Year #5
	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031
Total Incremental Revenue*	\$ 495,992	\$ 743,988	\$ 867,986	\$ 991,984	\$ 991,984
Total Expenditures	\$ 357,750	\$ 430,385	\$ 532,900	\$ 551,480	\$ 636,827
Projected Program Surplus/(Deficit)**	\$ 138,242	\$ 313,603	\$ 335,086	\$ 440,504	\$ 355,157

*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** 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:

Master Degree

Master of Science in Multidisciplinary Quantitative Sciences (MQS)

		Year #1	Year #2	Year #3	Year #4	Year #5	Year #6	Year #7	Year #8
		FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034
Enrollment Projections (Headcount)	Part-Time	2	3	3	4	4	5	5	4
	Full-Time	18	27	32	36	36	45	45	45
		20	30	35	40	40	50	50	49
Enrollment Projections (FTE)	Part-Time	1	1.5	1.5	2	2	2.5	2.5	2.5
	Full-Time	18	27	32	36	36	45	45	45
		19	29	34	38	38	48	48	48
Degree Completions Projection		14	21	25	29	29	36	36	36
							Three-Year Average 36		
Projected Completion Rate:		75							
CIP Code:		30.7099							

Indiana Commission for Higher Education

New Degree Program Proposal for Public Institutions

2025-2026

M.S. in Multidisciplinary Quantitative Sciences To Be Offered by Purdue University at Indianapolis

Program Details	
Degree Award Level:	Master's
Mode of Delivery (On-Campus Only, Online Only, or Blended):	On-campus
Nature of Distance Education (100% Online, Blended, or None) :	Blended
Academic Unit(s) Offering Program: College, School, Department(s):	College of Science
Credit Hours:	30
Suggested CIP Code:	30.7099



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4. **Evidence of Positive Student Outcomes: Job Placement, Wages, and Student Debt 12**

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7. **Programmatic Costs 31**

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1. Program Description & Developmental Timeline

a. Program Description

- Provide a short, comprehensive description of the proposed degree program that would be available to prospective students and other interested stakeholders. This description, or a slightly altered version, would be included on the institution's web site upon launch and relevant promotional materials.

Indiana's and the nation's industries increasingly need professionals with integrated expertise in artificial intelligence, machine learning, statistics, and quantitative modeling to drive data-informed innovation across sectors such as manufacturing, finance, and technology. The **Master of Science in Multidisciplinary Quantitative Sciences** uniquely meets this demand. The program's structure of offering multiple majors within one program allows students to gain both depth in a chosen domain and breadth across complementary quantitative disciplines. By combining rigorous training with applied, cross-sector skills, the program will strengthen Indiana's talent pipeline for smart manufacturing, digital transformation, and analytics-driven decision-making.

This program is being developed for Purdue University's *Indianapolis location*, and will leverage rapidly growing opportunities to engage with corporate partners in the area. The program encompasses multiple majors (Data Science; Applied Statistics; and Quantitative Finance, Insurance, and Risk Management), building from a core in statistical, computing, and quantitative sciences, with a blend of topics that emphasize data, modeling, and computation. Highlights of the three MS majors are:

- The **MS major in Applied Statistics** has been designed in consultation with Eli Lilly, with focus on clinical trials analyses, and aligns with Purdue University's One Health strategic Initiative, endorsed by the Purdue Board of Trustees in June 2024, including partnership with Elanco Animal Health Inc. and Indiana's new One Health Innovation District.
- The MS major in **Quantitative Finance, Insurance, and Risk Management (QFIRM)** will augment the BS in Actuarial Science being offered in Indianapolis, and leverage the strength of the Society of Actuaries-designated Center of Actuarial Excellence at Purdue University.
- The **MS major in Data Science** will complement academic offerings in Sport Management, being offered in Indianapolis (and also in West Lafayette). The College of Science will teach two entry-level data analytics courses for the MS in Sport Management program, with similar reciprocity for Data Science students in this program to have access to selected courses in sport analytics, to broaden their skillset and career options.

b. Development Timeline

- Provide a timeline of key milestones in the development of this proposal and its progress through the institutional approval process before submission to the Commission, e.g., discussions at the department level, employer/industry engagement, discussions with non-HLC programmatic accreditors, examination of program exemplars, campus curriculum committee approvals, and Board of Trustees approval. Briefly explain any notable delays or pauses in the degree program's development.

Date	Milestone
June 2023	The Boards of Trustees from both Indiana University and Purdue University approved an agreement to formalize the separation of Indiana University-Purdue University Indianapolis, resulting in the creation Purdue University in Indianapolis, to begin its separate Indianapolis operations in fall 2024. https://www.purdue.edu/newsroom/2023/Q2/indiana-university-and-purdue-university-sign-historic-agreement/

Fall 2023	The College of Science worked on developing ideas for academic programs for Purdue University in Indianapolis,
Spring 2024	The predecessor of this program (as a Master of Science in Data Science) was submitted on April 15, 2024, in response to a call to Purdue University's colleges for proposals for new academic programs in Indianapolis. This proposal was approved by leadership of the Purdue's Indianapolis location in June of 2024.
Fall 2024	Purdue's Indianapolis location welcomed its inaugural class of 800+ students. The Purdue College of Science development of the MS in Data Science program and other programs for Indianapolis included: • Working with Purdue University leadership to synergize with other efforts (Assistant Vice Provost for Academic Initiatives; Associate Vice Provost for Purdue University in Indianapolis) • Overlapping with development of actuarial science programs in Indianapolis; the initial focus was on the undergraduate level (to launch in Fall 2025), but quick awareness of the value to expand to master's level. • The Department of Statistics engaged in internal conversations about updating financial statistics training, and external conversations with Eli Lilly's statistics division, beginning visioning master's level training in applied statistics. • College of Science leadership (dean and associate dean for graduate education) developing collaboration in data science for sport analytics. These efforts lead to the concept to <u>bring together these three interrelated areas</u>: the original MS in Data Science, an MS in applied statistics, and an MS to cover actuarial science to incorporate risk management and data science in finance.
December 2024	The culmination of these discussions through fall 2024 led to an <u>integrated program called "MS in Multidisciplinary Quantitative Sciences."</u> This program was discussed and approved at the December College of Science senior leadership meeting of deans and senior staff.
Spring 2025	The proposal for the Master of Science in Multidisciplinary Quantitative Sciences (with three majors: Applied Statistics, Data Science, Actuarial Science / Quantitative Finance, Insurance, and Risk Management) was submitted on March 7, 2025, in response to a call for proposals for new academic programs in Indianapolis. This proposal was approved by leadership of the Purdue's Indianapolis location in April of 2025.
Fall 2025	Proposals for and development of new graduate courses for the MS in Multidisciplinary Quantitative Sciences program launched within Purdue University. Approval by College of Science Faculty Council October 23, 2025
2026 (projected)	Review by Purdue University Graduate Council (February-March), Board of Trustees (August), and Indiana Commission on Higher Education Academic Affairs & Quality Committee, and then whole commission (fall). Program launch - fall semester 2027

2. Rationale for the Program

a. **Rationale: General**

- What problem is this proposed degree program trying to solve? The rationale must make a compelling, thorough justification why establishing a new program of study is responsive to current and future talent needs.

The Master of Science in Multidisciplinary Quantitative Sciences program will provide training that is highly responsive and adaptable to emerging areas and rapidly changing technological needs for employers in a range of American industry areas, including manufacturing, healthcare, supply chain, finance, and logistics. In-demand topics that are covered in this program include machine learning, data visualization, data mining, and project management. Additionally, specifically for students in the MS in Data Science major, there will be opportunity to integrate with the MS in Sport Management program (established Fall 2025), and similarly, for students in the MS in Sport Management to integrate with this MS program. This will allow for cross-discipline learning and production of employees for the rapidly growing sports-driven economy in Indiana, and Indianapolis in particular.

This program addresses a critical "talent-readiness gap" that threatens Indiana's economic leadership in an era of rapid digital transformation. While Indiana has secured historic investments in the "Hard Tech" and "One Health" sectors, the state's continued prosperity depends on a workforce capable of not just using technology, but building and validating the models that drive it.

The central problem is that existing academic pathways often operate in silos, producing graduates who lack the integrated expertise in artificial intelligence, machine learning, and statistical modeling required by Indiana's most vital employers. This program addresses that gap by offering a unique, three-pronged curriculum in Applied Statistics, Data Science, and Quantitative Finance, Insurance, and Risk Management (QFIRM). By housing these disciplines under one roof, the MQS program ensures that graduates can translate complex data into actionable decision-making tools for multiple sectors, ranging from clinical trials at Eli Lilly to the burgeoning "sportconomy" in Indianapolis.

The program also presents an opportunity to support the state's efforts to address talent attrition and stalled economic mobility. Current data from the Post-Secondary Employment Outcomes explorer highlights a concerning "brain drain," showing that Indiana retains less than 30% of its master's-level mathematics and statistics graduates after five years. By providing a residential, practice-oriented program in Indianapolis, Purdue directly intervenes in this cycle, keeping the state's highest-potential talent within its borders.

Furthermore, the State of Indiana's HOPE Agenda emphasizes the need for measurable distinction in economic mobility. With professions like Data Science and Actuarial Science designated as "Fastest Growing" and "High Wage" occupations by the Bureau of Labor Statistics, the MQS program provides a direct engine for Hoosiers to enter the upper tiers of the modern workforce.

In summary, the MQS program is a mission-critical alignment with Purdue University's strategic pillars and the state's economic development goals. It bridges the gap between Indiana's industrial strengths and the digital future, ensuring that the state remains a premier destination for global business and a leader in high-quality, data-driven innovation.

b. Institutional Rationale: Mission and Strategic Alignment

- Categorize this proposed degree program as one of the following:

Mission Critical	☒
Mission Aligned	☐
Discretionary	☐

- If the proposed degree program is Mission Critical or Mission Aligned, explain how the program will harness and complement institutional strengths? How is it consistent with the mission of the institution and the institution's strategic plan to wisely allocate limited resources to maximum effect? (Provide a link to the strategic plan and refer to the relevant section(s).)

The Master of Science in Multidisciplinary Quantitative Sciences program is [Mission Critical](#), aligning with Purdue University's strategic initiatives defined by [four specific pillars](#), and exemplifying the institution's vision to "build a better world — together...providing practical solutions to today's toughest challenges." This MS program will provide cross-discipline knowledge and skills in the quantitative sciences that will be crucial for high-quality data-driven decision making, and applicable for a wide range of careers and employment arenas. The Mission Critical designation is also illustrated by the following:

- Establishing this master's program in Indianapolis supports the strategic pillar of [Purdue University in Indianapolis](#).
- The MS major in Applied Statistics, with its focus on clinical trials analyses, aligns with Purdue University's [One Health strategic Initiative](#), endorsed by the Purdue Board of Trustees in June 2024, and including partnership with Indiana's new One Health Innovation District in Indianapolis.
- The MS major in Data Science, with its opportunity for interested students to intersect with learning opportunities connected with the MS in [Sport Management](#) (both courses and experiential learning opportunities using data from sport industry partners) aligns with Indiana's and Indianapolis's standing as the "Sports Capital of the World."

- If the proposed degree program is Discretionary, provide a compelling rationale to expand the scope of the institution that would add rather than detract (or distract) from other academic programming and the institution's strategic plan to wisely allocate limited resources to maximum effect. (Provide a link to the strategic plan and refer to the relevant section(s).)

Not applicable.

c. State Rationale: Postsecondary Educational Attainment

- Briefly explain how the proposed degree program will address the State of Indiana's talent priorities as reflected in the Commission's most recent strategic plan, the [HOPE \(Hoosier Opportunities & Possibilities through Education\) Agenda](#)?

An overarching goal of Hoosier Opportunities and Possibilities through Education (HOPE) is to help the state retain individuals who complete higher education in Indiana. The MS in Multidisciplinary Quantitative Sciences will help to do this by providing training that is responsive to needs of Indiana businesses and industries in a range of employment sectors, including manufacturing, healthcare, supply chain, finance, and logistics.

Support for learners at a range of levels with efficient time to degree (relevant to HOPE Goal #3).

- The program offers flexibility for adult learners, with opportunity do this program part-time and with some courses online.
- We will support undergraduates in developing sophisticated skills at the master's levels through a **BS+MS** program option. Our college staff who work with prospective undergraduate students say that these students and their parents are keenly interested in BS+MS options. Our BS+MS option will allow current undergraduate students at Purdue at the West Lafayette and Indianapolis campuses to complete their bachelor's and master's degrees in as little as five years. Undergraduates in a variety of bachelor's degree majors can begin taking graduate-level courses for the Multidisciplinary Quantitative Sciences program during their senior year, integrating seamlessly into their MS-level study.

Advancing Indiana's economic engine - The opportunity for students in the MS in Data Science to integrate with the newly established Sport Management programs will allow cross-discipline learning and production of employees for the rapidly growing "sportconomy" in Indianapolis. (relevant to HOPE Goal #7)

Support for military veterans: Purdue University's [Veterans and Military Success Center](#) provides support for admitted veterans. Purdue Online is structured with support for the unique needs of military learners through the [Veterans and Military Success Center](#) and [success coaches](#) who work with students throughout their study to assist them with skills for degree completion and transition to the civilian workforce.

d. National Rationale: Economic Competitiveness, National Security, and/or National Interest

- Briefly explain how this proposed degree program will help advance national economic competitiveness, national security, and/or a key national interest.

A critical foundational skillset of data analysis and specifically for the MS in Multidisciplinary Quantitative Sciences is utilization of artificial intelligence and machine learning, statistical modeling. The MS in Multidisciplinary Quantitative Science will strengthen the nation's capacity in these key skills that are essential for innovation, economic growth, and security. Graduates will enhance productivity and resilience in critical sectors such as manufacturing, finance, energy, and technology by applying advanced quantitative methods to complex, data-driven challenges. The program's multidisciplinary structure fosters talent capable of integrating analytics, computation, and decision science to improve efficiency, reduce risk, and drive innovation. By developing professionals who can lead data-intensive initiatives, the program supports U.S. competitiveness, technological leadership, and national security in an increasingly digital economy.

3. Career Relevance and Evidence of Market/Societal Need

a. External Input on Program Design.

- Elaborating on the information provided in the degree program's developmental timeline under (1.b.), briefly describe external input on program design. Potential examples include employer advisory boards or surveys, industry forums, evolving trends in the academic/disciplinary field, and accreditation/licensure standards. Clarify if this is an outgrowth of a current certificate, minor, and/or degree's concentration/track. (Link to any relevant entities.)

We benchmarked peer programs across Big Ten and national universities and intentionally differentiated the MS in Multidisciplinary Quantitative Sciences by offering multiple majors within one flexible, practice-oriented degree program. We also reviewed market and employment demand surveys (regional employer needs, National Association of Colleges and Employers (NACE) competencies, and professional credential bodies) to align outcomes with in-demand transferable skills. The program formalizes and scales Purdue's existing strengths (e.g., graduate-level coursework in statistics and computer science, data science certificates, and applied ecosystems like [Purdue's Data Mine](#)) into a professional MS tailored to employer demand and career readiness.

Additionally, we consulted a broad set of practitioners — Indiana and Midwest leaders in manufacturing, finance/insurance, tech, and healthcare — through advisory and collaborative conversations to identify priority skills in AI/ML/Statistics, cloud/data engineering, and model risk governance. To provide specific examples of this:

- The Purdue Department of Statistics has a long-running relationship with Eli Lilly's statistics division, with increased engagement since 2023 spearheaded by Xiao Wang (department head) and Lingsong Zhang (associate professor) in Purdue's Department of Statistics, and Yongming Qu (Vice President), Veavi Chang (Director), and Haoyun Yin (Advisor) at Eli Lilly. As part of this relationship, Eli Lilly helped vision master's level training in applied statistics. This included specific design of the program curriculum to align with what Lilly envisioned as its hiring needs.
- This program has developed a collaboration with Purdue's MS in Sport Management program, led by Lucy Flesch, dean of the College of Science, Janice Evans, associate dean of the College of Science, Jeanne Boyd, executive director of Sport Management, and Patrick Tutka, program director of Sport Management, who in turn are well connected with the sports tech industry. This team has visioned multiple opportunities for crosstalk between the two MS programs to provide students with preparation for employment in Indiana's and Indianapolis's rapidly expanding sport sector. Data analytics are incorporated into the sport management program, and students in the data science major of the MS in Multidisciplinary Quantitative Science can augment their training with a certificate in Fundamentals of Sport Management.

b. Program Learning Outcomes: Competencies, Skills, Knowledge, and Experiences

- List the significant learning outcomes that students completing this degree program are expected to master, which would be public. If applicable, specify usage of any non-HLC programmatic accreditation standards, industry qualification frameworks, or certification/licensure standards. (Link to any specified standards.)
- Mathematical and Statistical Foundations: mastery of probability, inference, linear algebra, optimization, and stochastic modeling for real-world problem solving.
- Artificial Intelligence and Machine Learning Competence: ability to design, train, validate, and interpret ML models (supervised/unsupervised), with attention to generalization, bias, and explainability.
- Modeling & Uncertainty Quantification (UQ): skill in building and diagnosing statistical/decision models, with rigorous uncertainty quantification, simulation, and sensitivity analysis.
- Computing & Data Engineering: proficiency in Python/R/SQL, reproducible workflows, version control, and scalable/cloud data pipelines for large, messy data.
- Communication and Translation: clear written/oral storytelling and visualization for technical and executive audiences; effective teamwork and project management.
- Applied Experience: comprehension of application of knowledge to real-world problems through of experiential learning through in-class projects, industry-facing projects, and/or capstones and internships producing a deployable analysis, model, or decision tool.

c. Indiana-Specific Talent Needs: Strategic Plans, Studies, and Reports

- Explain how this proposed degree program would help address Indiana's talent priorities as reflected in the most recent strategic plans, studies, and/or reports of relevant local, regional, or state authoritative entities, such as regional workforce boards, the Bowen Center for Health Workforce Research and Policy, the Indiana Economic Development Corporation, the Indiana Early Learning Advisory Committee, the Indiana Health Workforce Council, the Indiana Institute for Workforce Excellence, Ascend Indiana, AgriNovus Indiana, BioCrossroads, Conexus Indiana, and TechPoint. (Link to cited sources.)

- The [Bowen Center for Health Workforce Research and Policy](#) "[analyzes] complex health workforce issues and [informs] related policy and programming," with "**DATA**" specified as one of four pillars for their work. This aligns with both the [data science](#) and [applied statistics](#) majors of the MS in Multidisciplinary Quantitative Sciences program.
 - The [Indiana Economic Development Corporation](#), the state's central public-private partnership that helps economic development in the state, highlights the Artificial Intelligence and Data talent pool in the state as a key asset for business launches, expansions, and relocations in Indiana. AI and data science are core areas of the MS in Multidisciplinary Quantitative Sciences program.
 - The [Governor's Health Workforce Council](#) has multiple internal/in-state initiatives, one being the Indiana Data Hub, meshing with the [data science](#) major of the MS in Multidisciplinary Quantitative Sciences program.
 - [Conexus Indiana](#), with its focus on advanced manufacturing and logistics (**AML**), highlights that "Automation and data are transforming" this industry sector. The emphasis of the MS in Multidisciplinary Quantitative Sciences program on data science, data analytics, statistics, risk management, and AI, will place graduates in a strong position to contribute in AML industries.
- Summarize any additional regional, state, or national studies that address current and future talent needs served by this proposed degree program. (Link to cited sources.)

The data in the table below are from the [U.S. Bureau of Labor Statistics Occupational Outlook Handbook](#), for a range of professions relevant to the MS in Multidisciplinary Quantitative Sciences. These data demonstrate **very strong job outlooks for graduates of this program**:

Profession	Number of Jobs, 2024	Job Outlook, 2024-2034	Source Link
Data Science	245,900	Much faster than average (34%)	https://www.bls.gov/ooh/math/data-scientists.htm
Actuaries	33,600	Much faster than average (22%)	https://www.bls.gov/ooh/math/actuaries.htm
Management analysts	1,075,100	Much faster than average (9%)	https://www.bls.gov/ooh/business-and-financial/management-analysts.htm
Mathematicians and Statisticians	34,600	Much faster than average (8%)	https://www.bls.gov/ooh/math/mathematicians-and-statisticians.htm
Operations Research Analysts	112,100	Much faster than average (21%)	https://www.bls.gov/ooh/math/operations-research-analysts.htm
Financial analysts	429,000	Faster than average (6%)	https://www.bls.gov/ooh/business-and-financial/financial-analysts.htm

d. Identify the Most Relevant Occupations and Industries

- Specify the specific occupations, general occupational classifications, and industry sectors that are the most relevant to the proposed degree program in terms of competencies, knowledge, skills, and experiences, including any accreditation/licensure standards, if applicable, acknowledging not all postsecondary degrees are direct preparation for a narrow list of occupations or industries.
 - Cite authoritative sources that connect learning outcomes with employment opportunities, such as the Classification of Instructional Program (CIP) – Standard Occupational Code (SOC) mapping of the U.S. Department of Labor's (USDOL) [Occupational Information Network \(O*NET\)](#), the Bureau of Labor Statistic's (BLS) [Occupational Outlook Handbook](#), the State of Indiana's 'Credentials of Value List,' the graduate to industry sector employment flows of similar programs of study (4-digit CIP Code Level) from the [U.S. Census Bureau's Post-Secondary Employment Outcomes \(PSEO\)](#) data, or proprietary CIP-SOC tools, e.g., Lightcast and Gray DI.

- o Summarize the most prevalent job titles as well as credentials, knowledge, skills, and competencies included in recent regional/Indiana job postings that are most relevant to the proposed degree program. The proposal must demonstrate employers are regularly searching for graduates of this proposed program.

Twenty-seven different job titles were listed as "Top Posted Job Titles" in Lightcast Program Overview reports with CIP codes relevant to this program (30.7001, Data Science, General; 30.7099, Data Science, Other; 30.7101, Data Analytics, General; 52.1304, Actuarial Science; 27.0601, Applied Statistics, General; 26.1102 Biostatistics), or were suggested by faculty who have had students hired into certain positions/job titles with relevant industries. The list of these is provided in [Appendix 1](#).

To categorize these various job titles, [O*NET OnLine](#) was searched with these job titles, identifying [Standard Occupational Classification \(SOC\) codes](#) associated with each job title.

Employment data for the major SOC groupings relevant to these "Top Posted Job Titles" were obtained from [CareerOneStop](#):

Occupation, SOC code	Employment		Annual projected job openings	
	US (2024)	Indiana (2022)	US	Indiana
Data Scientist (includes clinical data manager), SOC 15-2051	245,900	2200	23,400	230
Actuary , SOC 15-2011	33,600	190	2,400	20
Management Analyst , SOC 13-1111	1,075,100	13,510	98,100	1290
Computer Systems Analyst , SOC 15-1211	521,100	8740	34,200	640
Computer Systems Engineers/Architects ; SOC 15-1299	472,000	3840	31,300	300
Financial and Investment Analysts ; SOC 13-2051	368,500	3150	25,100	230
Operations Research Analyst , SOC 15-2031	112,100	1500	9600	140

Appendix 1: Provide the list of occupations and occupational classifications relevant to the proposed degree program. Provide analyses of the most recent regional/Indiana job posting analytics. (This appendix should contain the detailed tables and/or relevant pages from the analyses.)

e. Occupational Outlook: Projected Employment Trends

- As required under IC 21-18-9-5(b), summarize the current and projected labor market supply and demand for the occupations, occupational classifications, and industries identified as most relevant to the proposed degree program under (3.d.). Provide evidence in regional (if available), state, and national terms. The proposal must demonstrate graduates of the proposed degree program should have promising career opportunities.

In statewide and/or regional terms, are any of the most relevant occupations identified under (3.d.) listed among the top-three categories under the Indiana Department of Workforce Development's (DWD) [‘Top Jobs’](#):

5- Star 'Top Jobs'	Yes ☒	No ☐
Data Scientists, Clinical Data Managers, Computer Systems Engineers/Architects, Management Analysts		
4-Star 'Top Jobs'	Yes ☒	No ☐
Actuaries, Bioinformatics Scientists, Financial Analysts, Financial Quantitative Analysts, Financial Risk Specialists, Market Research Analysts and Marketing Specialists, Operations Research Analysts		
3-Star 'Top Jobs'	Yes ☒	No ☐
Statisticians		

In statewide, regional, and/or national terms, are any of the most relevant occupations or occupational classifications identified under (3.d.) categorized by the USDOL's Bureau of Labor Statistics as the '[Fastest Growing \(Projected\)](#)' or '[Most New Jobs/Occupations with the Most Job Growth \(Projected\)](#)' or by USDOL's O*Net as a '[Bright Outlook](#)' occupation:

Yes ☒	No ☐
--	------------------------------------

List, specifying the geography, respective designation(s), and any applicable growth rate category:

Fastest growing (<https://www.bls.gov/ooh/fastest-growing.htm>)

Data Scientist (#4 fastest growing)

- expected to grow by 34%
- projected numeric change in employment of 82,500 from 2024 to 2034.
- 23,400 openings for data scientists are projected each year, on average, over the decade.
- 35% of workers in this field have a master's degree.
- Some employers require or prefer that applicants have a master's or doctoral degree.

Sources:

<https://www.bls.gov/ooh/math/data-scientists.htm>

<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Data%20Scientists&location=United%20States&onetcode=15-2051.00>

Actuaries (#8 fastest growing)

- expected to grow by 22%
- projected numeric change in employment of 7300 from 2024 to 2034.
- 2400 openings for data scientists are projected each year, on average, over the decade.
- 22% of workers in this field have a master's degree.

Sources:

<https://www.bls.gov/ooh/math/actuaries.htm>

<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Actuaries&location=United%20States&onetcode=15-2011.00>

<https://www.onetonline.org/link/localtrends/15-2011.00?st=IN>

Operations Research Analysts (#9 fastest growing)

- expected to grow by 21%
- projected numeric change in employment of 24,100 from 2024 to 2034.

- 9600 openings for data scientists are projected each year, on average, over the decade.
- 28% of workers in this field have a master's degree.

Sources:

<https://www.bls.gov/ooh/math/operations-research-analysts.htm>

<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Operations%20Research%20Analysts&location=United%20States&onetcode=15-2031.00>

*Appendix 2: In addition to the narrative and questions above for (3.f.), provide a summary of Indiana DWD data and 'Top Jobs' occupational rankings, U.S. BLS data, O*NET data, proprietary tools like Lightcast or Gray DI, etc. (This appendix should contain the detailed tables addressing occupation/occupational-specific details as well as applicable industry sector(s) projections on percentage growth, relative growth to average occupational growth, and the absolute employment change, upon which the narrative summary of future labor market demand is based including Indiana-specific information and/or relevant pages from the analyses.)*

4. Evidence of Positive Student Outcomes: Job Placement, Wages, and Student Debt

a) **Student Career Exploration and Planning**

- As required under IC 21-18-9-5(b), explain how the proposed program will advise students on career exploration and planning that includes timely information about the labor market and career pathways?

The MS in Multidisciplinary Quantitative Science will facilitate employer connections by offering applied capstones with industry-defined problems, optional internships coordinated with Purdue's Center for Career Opportunities (CCO), and regular employer talks, panels, and networking sessions on the Purdue Indianapolis campus. The program will seek advisory input from partners in manufacturing, finance/insurance, tech, and healthcare to keep projects relevant and visible to recruiters. Carefully structured touchpoints are designed to increase meaningful employer engagement and interview opportunities. The work of the CCO is augmented by the Purdue College of Science Student Success team, who are responsible for design and implementation of initiatives to enhance graduate student development and engagement. This team designs creative opportunities to expand specific competencies that shape students' professional identities, with the overall goal of meeting students' needs and supporting progression toward earning advanced degrees.

The CCO also provides *dedicated Master's Career Planning appointments*. These sessions focus on career exploration, industry-specific job searches, and the translation of quantitative skills into professional value propositions. To provide "timely information about the labor market," the CCO maintains a Data Dashboard that tracks real-time starting salaries, top hiring employers for Purdue graduates, and industry-specific success rates. This internal data is supplemented by digital tools like myCCO, a specialized portal where over 1,800 employers specifically target Purdue talent, allowing students to see exactly which companies are recruiting for roles in Applied Statistics, Data Science, and QFIRM.

This master's program's *location in Indianapolis* provides unique access to localized labor market intelligence through partnerships with entities like TechPoint and AgriNovus. Students will be advised through:

- Career Research Portals: Centralized discipline-specific job boards and employer databases that allow for granular exploration of niche sectors like clinical analytics or quantitative finance.
- Experiential Touchpoints: Integration with the Data Mine and the Office of Professional Practice, which provide work-based learning opportunities that serve as a practical form of career "auditioning" and pathway planning.

- Annual Surveys: Participation in the Next Step Survey ensures that the program continuously adjusts its advising based on the actual outcomes and shifting salary trends of its recent graduates.

Finally, the Purdue Indianapolis location has dedicated staff who assist with students with employer connections and career exploration and planning, including Senior Manager of Center for Career Opportunities (Katie Nelson); Director of Career Relations for Indianapolis (Patrick Francis); Assistant Director of Co-op Programs and Student Development (Katrin Danielson); and several members of the Office of Professional Practice team.

b) Connecting Students with Employment Opportunities

- As required under IC 21-18-9-5(b), explain how the proposed program will facilitate direct connections between students and employment opportunities?

The primary vehicle for direct employment connection is the program's emphasis on applied, industry-defined experiences. Students engage in industry-framed projects and applied capstones that utilize real-world datasets and problems provided by corporate partners in manufacturing, finance, and healthcare. These high-impact practices allow students to demonstrate their technical proficiency to potential recruiters in a "real-world" context, effectively serving as an extended interview process. For example, the Applied Statistics major was designed in direct consultation with **Eli Lilly** to ensure the curriculum aligns with the specific hiring needs of the clinical trials sector.

Proximity and Networking in the Indianapolis Hub

The program leverages its location in Indianapolis to maximize "meaningful employer engagement". The campus serves as a hub for:

- **Direct Employer Interaction:** Regular employer talks, practitioner-led critiques, and networking panels are held on the Indianapolis campus, bringing recruiters directly to the student population.
- **One Health and Sportconomy:** Partnerships with the **One Health Innovation District** and the **Indianapolis sport industry** provide niche pathways into high-growth local sectors that are actively seeking quantitative talent.

Centralized Career and Professional Practice

The MS in MQS program utilizes specialized university offices to manage formal employment pipelines:

- **Center for Career Opportunities (CCO):** Provides a direct link to a network of over 1,800 employers who specifically recruit Purdue students, facilitating interviews and job placements.
- **Office of Professional Practice (OPP):** Coordinates optional **internships and co-op programs**, providing a structured framework for students to gain professional experience while completing their degrees.

Career Relations for Indianapolis: Dedicated personnel, such as the Director of Career Relations for Indianapolis, work exclusively on building bridges between Indianapolis-based companies and MQS students to ensure a high rate of local graduate retention.

c) Job Placement

- As required under IC 21-18-9-5(b), provide the projected job placement rate for program graduates, including the projected job placement rate related to a graduate's level of education or training, including estimates of underemployment. (Link to cited sources and authoritative proxies used as the basis for the projection, e.g., The New York Federal Reserve's [‘Labor Market Outcomes for Recent College Graduates’](#) by major.)

The data in the table below are from the [U.S. Bureau of Labor Statistics Occupational Outlook Handbook](#), for a range of professions relevant to the MS in Multidisciplinary Quantitative Sciences. These data demonstrate **very strong job outlooks for graduates of this program.**

Profession	Number of Jobs, 2024	Job Outlook, 2024-2034	Source Link
Data Science	245,900	Much faster than average (34%)	https://www.bls.gov/ooh/math/data-scientists.htm
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Management analysts	1,075,100	Much faster than average (9%)	https://www.bls.gov/ooh/business-and-financial/management-analysts.htm
Mathematicians and Statisticians	34,600	Much faster than average (8%)	https://www.bls.gov/ooh/math/mathematicians-and-statisticians.htm
Operations Research Analysts	112,100	Much faster than average (21%)	https://www.bls.gov/ooh/math/operations-research-analysts.htm
Financial analysts	429,000	Faster than average (6%)	https://www.bls.gov/ooh/business-and-financial/financial-analysts.htm

- If the program is primarily a feeder for graduate/professional programs, please describe the programs most graduates are expected to attend. (Link to examples of relevant programs.)

Not applicable

d) Graduate Retention

- In reference to facilitating direct connections between students and employers under (4.b.) and the regional/state workforce demand data under (3.e.), describe how this program will improve the institution's in-state graduate retention rate.

Data on Indiana employment trends from [O*NET OnLine](#) for professions related to the MS in Multidisciplinary Quantitative Sciences show significant employment opportunities and projected growth in **Indiana**:

Job title (Occupation code)	Employment in Indiana (2022)	Projected employment in Indiana (2032)	Projected growth in Indiana	Projected annual job openings (2022-2032)	Source
Data Scientist (15-2051.02)	2200	2980	36%	230	https://www.onetonline.org/link/localhost/15-2051.00?st=IN
Actuary (15-2011.00)	190	240	26%	20	https://www.onetonline.org/link/localhost/15-2011.00?st=IN
Operations Research Analyst (15-2031.00)	1500	1860	24%	140	https://www.onetonline.org/link/localhost/15-2031.00?st=IN
Statistician (15-2041.00)	270	360	33%	30	https://www.onetonline.org/link/localhost/15-2041.00?st=IN
Computer Systems Engineers/Architects (15-1299.08)	3840	4320	13%	300	https://www.onetonline.org/link/localhost/15-1299.08?st=IN
Management Analysts (13-1111.00)	13,520	14,930	11%	1290	https://www.onetonline.org/link/localhost/13-1111.00?st=IN

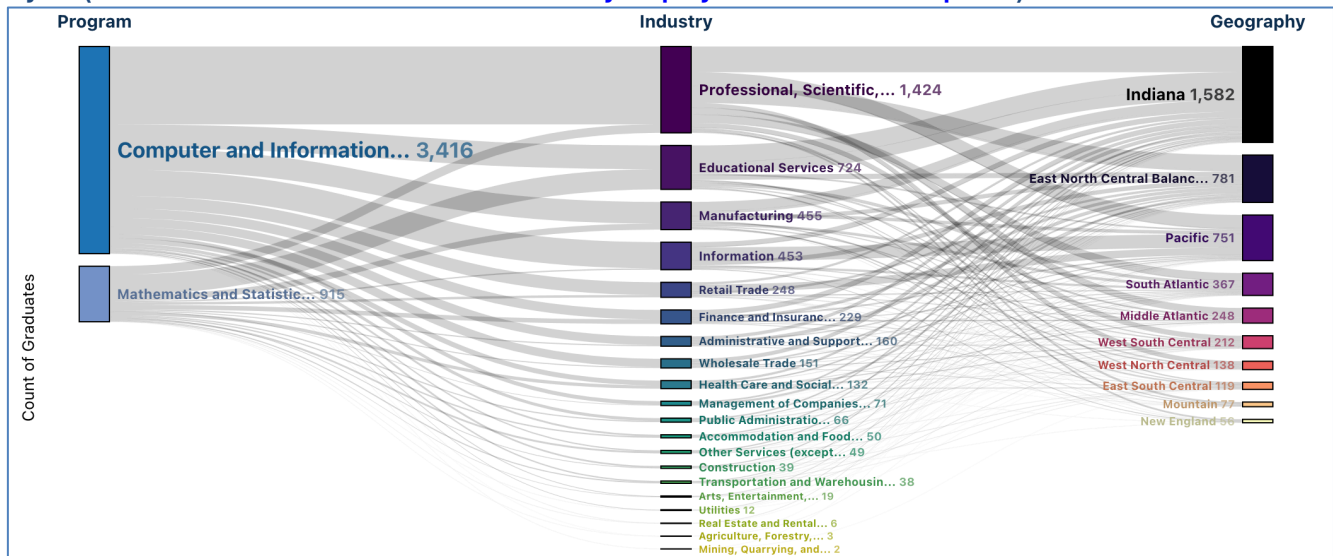
- As required under IC 21-18-9-5(b), provide the program's projected graduate retention rate upon graduation and after five years. (Link to cited sources as a basis for the projection.)

Data from the Post-Secondary Employment Outcomes (PSEO) Explorer, examining master's degree level graduates in Indiana in Computer and Information Services and Support Services, and Mathematics and Statistics with post-graduation filter for 1 year and 5 years, show that:

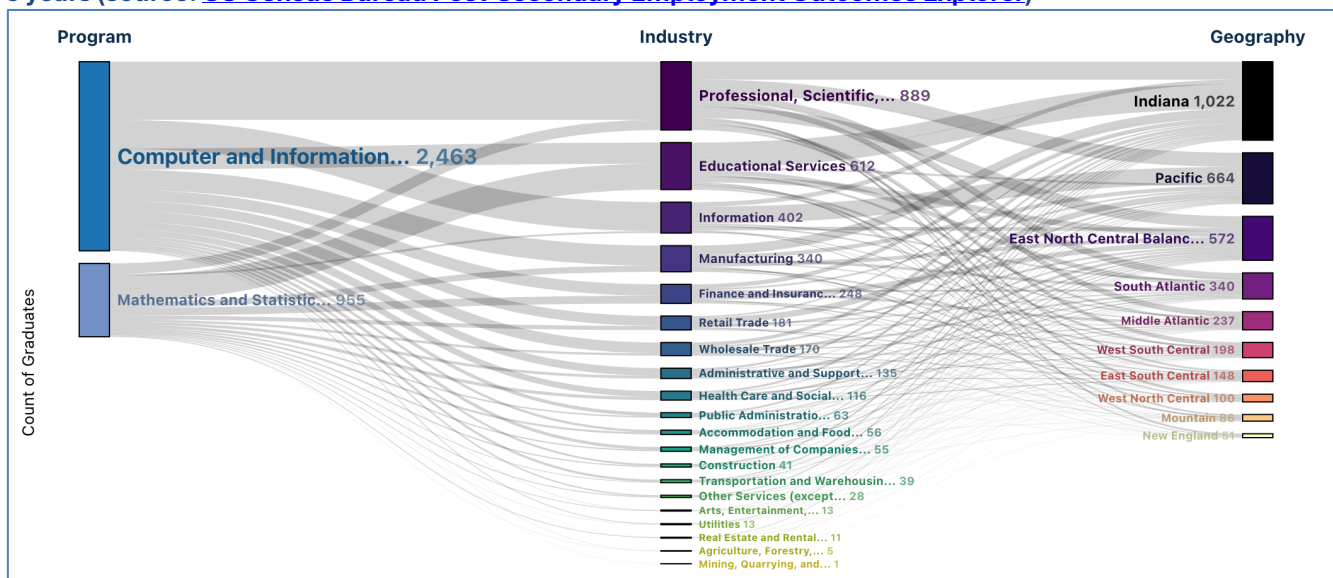
1 year: Of the 4331 master's level graduates in these two areas, **36.5% (1582)** are retained in Indiana.

5 years: Of the 3418 master's level graduates in these two areas, **29.9% (1022)** are retained in Indiana.

1 year (source: [US Census Bureau Post-Secondary Employment Outcomes Explorer](#))



5 years (source: [US Census Bureau Post-Secondary Employment Outcomes Explorer](#))



Sources:

<https://lehd.ces.census.gov/applications/pseo/?state=18&type=flows&specificity=2&institution=18°reelevel=07&gradcohort=0000-5&filter=1&destination=industry,geography&display=count&program=11,27>

<https://lehd.ces.census.gov/applications/pseo/?state=18&type=flows&specificity=2&institution=18°reelevel=07&gradcohort=0000-5&filter=5&destination=industry,geography&display=count&program=11,27>

e) Special Fees above Baseline Tuition

- Summarize any special fees above baseline tuition that are needed to support this program.

Not applicable

f) Student Return-on-Investment (ROI): Wages and Student Debt

- As required under IC 21-18-9-5(b), provide the estimated wages for graduates at the following career milestones, if available:

	Median salary in Indiana for all master's graduates	25 th Percentile	50 th Percentile	75 th Percentile
Starting	\$65,264 ^A	\$76,710 ^C	\$113,734 ^C	\$166,150 ^C
3 years after graduation	\$71,657 ^B	\$83,295 ^D	\$119,579 ^D	\$170,946 ^D
5 years after graduation	\$78,835 ^A	\$88,708 ^D	\$124,991 ^D	\$176,359 ^D
10 years after graduation	\$89,818 ^A	\$102,240 ^D	\$138,523 ^D	\$189,891 ^D
20 years after graduation	\$117,666 ^B	\$129,304 ^D	\$165,587 ^D	\$216,955 ^D
30 years after graduation	\$144,730 ^B	\$156,368 ^D	\$192,651 ^D	\$244,019 ^D

Sources of data

- US Census Bureau Post-Secondary Employment Outcomes Explorer (PSEO) data on Indiana state master's level program graduates from all instructional programs, Earnings-percentile Filter of 50; data for years 1, 5, and 10.
 - Salaries for years 3, 20, and 30 for Indiana state master's level program graduates from all instructional programs were calculated using a linear standard curve based on data for years 1, 5, and 10 ($y = \$2,706.4x + \$63,538$, $R^2=0.985$).
 - Lightcast report data on starting salaries for master's-level educated individuals in Data Science (30.7001), Actuarial Science (52.1304), and Applied Statistics (27.06) (representing the three majors of this program)
 - Salaries for years 3, 5, 10, 20, and 30 for master's-level educated individuals in Data Science, Actuarial Science, and Applied Statistics were calculated using a linear standard curve based on ($y = \$2,706.4x + b$, with b calculated as 98% of the starting salary for each percentile
- Compare the estimated wages (above) to the most recent authoritative median wage of the region/state, living wage of the region/state (e.g., MIT Living Wage Calculator), and median wage for individuals with the same or similar postsecondary credential in the region/state (e.g., PSEO and PSEO Coalition).

The estimated wages for each of the percentiles (25th, 50th, and 75th) calculated above significantly exceeds the Indiana average for an individual with a master's degree. This suggests that graduates of the MS in Multidisciplinary Sciences program have *significant potential for positive return on investment*.

Appendix 3: Provide a summary of wage data for graduates from similar programs at peer institutions and/or wages by experience level for the relevant occupations identified under (3.e.), citing authoritative sources such as the U.S. Census Bureau's Post-Secondary Employment Outcomes (PSEO) data, the PSEO Coalition's 'Living Wage vs.

Postsecondary Graduate Earnings' by certificate level, Indiana DWD and 'Top Jobs', the MIT 'Living Wage Calculator' for Indiana and region, U.S. Department of Education's College Scorecard, the New York Federal Reserve's labor market data for recent college graduates, Indiana DWD, U.S. BLS, Lightcast, other proprietary tools, etc. (This appendix should contain tables upon which the above estimates are based upon and/or relevant pages from the analyses.)

- As required under IC 21-18-9-5(b), provide the estimated average total student debt and average monthly student debt payment of in-state graduates. Explain the basis for the calculations. Compare the estimated student debt to in-state and regional benchmarks and the estimated wages for the proposed degree program's graduates above. If applicable, confirm these estimates incorporated any special fees above baseline tuition under (5.e.). (Link to any cited sources. Cost comparisons to other state educational institutions with similar programs should draw from the Commission's ['Data Accountability and Transparency Dashboard'](#) under IC 21-14-15-1.)

The following expenses come from the [Purdue University Bursar's office](#), for tuition and fees for 2024-2025.

<i>Billed through Bursar</i>	Cost
Tuition, Indiana resident - Fulltime, academic year (two semesters, 8+ credits hours per semester)	\$11,116
<i>Other expenses, not billed through Bursar</i>	
Housing/Food	\$20,020
Books, Materials, Supplies, and Equipment	\$700
Transportation	\$180
Miscellaneous and Federal Loan Fees (<i>will vary by type of loan</i>)	\$2,500
Annual total	\$34,516

Students who are working fulltime and doing the program parttime (<8 credits per semester) would pay the per credit hour rate, at \$ 347.85 per credit, totaling \$10,435.50 for 30 credits.

- Explain how graduates will realize a positive return-on-investment in terms of completion rate, time to completion, net cost, job placement, and upward mobility to help address the sixth statewide goal ['6. Measurable distinction in economic and social mobility and prosperity outcomes'] of the [HOPE \(Hoosier Opportunities & Possibilities through Education\) Agenda](#)? (Link to any cited sources.)

The estimated wages for each of the 25th, 50th, and 75th percentiles significantly *exceeds the Indiana average for an individual with a master's degree*. This suggests that graduates of the MS in Multidisciplinary Sciences program have *significant potential for positive return on investment*.

5. Market Intelligence: Student Demand, Provider Competition, and Projected Enrollment

a. Evidence of Student Demand and Interest

- The proposal must provide evidence of strong interest and demand amongst prospective students, describing how the institution investigated and assessed authoritative data. Briefly describe the proposed program's recruitment and enrollment strategy.

Evidence of interest of prospective students comes from data on **master's degree completions** in the fields related to this MS degree program: Data Science, General (30.7001); Actuarial Science (52.1304); Applied Statistics, General (27.0601); Data Analytics, General (30.7101) (Lightcast Program Overview reports).

	Completions (2024)	Institutions	Average completions per institution
Data Science	4322	94	46.0
Applied Statistics	369	22	16.8
Actuarial Science	232	18	12.9
Data Analytics	931	33	28.2

The plan for marketing the program the College of Science Marketing and Communications team will be responsible for marketing the program. This team has extensive experience in marketing for undergraduate programs, , and this experience will readily translate to marketing this new master's program. A significant focus will be a paid ad campaign, using YouTube pre-roll, Instagram Reels, Google Display, and STEM communities on Reddit. Strategically selected geographic areas will be prioritized, based on data from Lightcast reports that indicate regions of interest, and also subregions identified by Google Analytics and Google Trends. Impressions, clicks to the program site, and click-through rates will be monitored, and ad content and placement adjusted based on these metrics. This team has been highly successful in recruiting for other programs, with one very relevant example being the *BS in Data Science*, which has seen a **565% increase in applications** from 2018 when the program was established to 2025 (data in Appendix 4).

Appendix 4: In addition to the above narrative analysis, include authoritative data tables demonstrating student interest and demand, such as web traffic and search engine analytics and student surveys. Save the details for specific enrollment projections for (5.c.). (This appendix should contain graphs/tables, relevant pages from analyses, and/or links to cited sources.)

b. Provider Market Inventory: Details on Similar Programs at Other Institutions

The proposal must demonstrate the institution has carefully investigated the current provider landscape for similar programs within the state, Midwest geographic region, and, depending upon the nature of the program, across the nation.

List and Describe Similar Programs at Indiana Institutions

- Indiana institutions offering similar programs (on-campus and/or distance education). Include information on pertinent details, such as institutional Carnegie Classification; public/private; CIP Code; credit hours; on-campus/on-line/blended; any program specializations, concentrations, or tracks; any non-HLC programmatic accreditation/certification, if applicable; and, briefly identify what distinguishes these programs. Identify primary competitors, if applicable. (Provide a link to each program's primary webpage.)

This MS in Multidisciplinary Quantitative Sciences, while having similarities to the programs in Indiana listed in the table below, is unique in several ways:

- The program crosses different quantitative disciplines and offers three majors, with a core curriculum and then specialization courses for each major.
- This will be only residential Applied Statistics MS in Indiana.
- This will be the only residential MS program addressing actuarial science with the MS major in Quantitative Finance, Insurance, and Risk Management (QFIRM), leveraging the strength of the Society of Actuaries-designated Center of Actuarial Excellence at Purdue University.
- The Data Science major is unique for its connections to the MS in Sport Management program at Purdue, positioning graduates to contribute to the rapidly growing sport industry in Indiana.

- Of the institutions in Indiana offering master's degrees in CIP codes relevant to the MS in Multidisciplinary Quantitative Sciences, Purdue University is one of only two with "R1" Carnegie Classification Research Activity Designation (Research 1: Very High Research Spending and Doctorate Production).

Discipline (CIP code)	Institution	Carnegie Classification, public/private	Credit hours	Format	Link / notes
Applied Statistics (27.0601)	No master's or post-baccalaureate programs with this CIP Code in Indiana				
Data Science (30.7001)	Saint Mary's College, MS in Data Science	Special Focus: Arts and Sciences; Private non-profit, 4-year	30-33 for the 4 + 1 program or new BA to MS 3+1 program. 36 for cohort entering Fall 2024	Distance ed and res	Master of Data Science Graduate Studies Saint Mary's College
	Purdue University, MS in Data Science	Public, 4-year	30	Distance ed only	MS in Data Science
	Purdue University, Post-baccalaureate certificate in Data Science	Public, 4-year	9	Distance ed only	Foundations of Data Science Graduate Certificate
Data Analytics (30.7101)	Butler University (Business Analytics)	Private non-profit, 4-year or above	31-32 30	Distance ed only	Program: Business Analytics, MS - Butler University
	Indiana Wesleyan University - National and Global – MS in Data Analytics	Private non-profit, 4-year	30	Distance ed only	Online Master's in Data Analytics IWU
	Purdue University Global, Introduction to Data Analytics Micro-Credential	State-Affiliated Public, 4-year	20	Distance ed only	Introduction to Data Analytics Micro-credential Purdue University Global Academic Catalog
	Purdue University Global, MS in Applied Data Analytics	State-Affiliated Public, 4-year	52	Distance ed only	Master's Degree in Applied Data Analytics – Purdue Global
Actuarial Science (52.1304)	Ball State University, MA/MS in Actuarial Science	Public, 4-year	30-33	Residential (no distance ed)	Master's in Actuarial Science - Graduate Degree Program
	Indiana University-East, MS in Actuarial Science	Mixed Baccalaureate; Public, 4-year	30	Distance ed only	Actuarial Science M.S.: Degrees: Indiana University
	Indiana University-Indianapolis	Public, 4-year	30	Distance ed only	Actuarial Science M.S.: Degrees: Indiana University

	Indiana University-Northwest	Professions-focused Baccalaureate Medium; Public, 4-year	30	Distance ed only	Actuarial Science M.S.: Degrees: Indiana University
	Indiana University-South Bend	Professions-focused Baccalaureate Medium; Public, 4-year	30	Distance ed only	Actuarial Science M.S.: Degrees: Indiana University

Source: ["TransferIN Indiana" Academic Program Inventory](#)

List and Describe Similar Programs at Regional and Peer Institutions Outside Indiana

- Institutions in contiguous states, MHEC states, or the nation, depending upon the nature of the proposed program, offering similar programs (on-campus and/or distance education). Include information on pertinent details, such as institutional Carnegie Classification; public/private; credit hours; on-campus/on-line/blended; any program specializations, concentrations, or tracks; any non-HLC programmatic accreditation/certification, if applicable; and, briefly identify what distinguishes these programs. Identify primary competitors, if applicable. (Provide a link to each program's primary webpage.)

There are 196 four-year, public or private non-profit institutions nationwide that offer advanced degrees in either Data Science, General (30.7001); Data Science, Other (30.7099); Actuarial Science (52.1304); Applied Statistics, General (27.0601); Data Analytics, General (30.7101); Data Analytics, Other (30.7199) ([National Center for Education Statistics College Navigator search](#)). Of these 196 institutions:

- 56 are in MHEC states (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin).
- 74 have the Carnegie Classification of "Research 1: Very High Spending and Doctorate Production" (R1).
- 25 are members of the Association of American Universities (AAU).

Please see the table on the next page, under "Provider Market Analysis," for information on the top five institutions for each CIP code; additional information is in Appendix 5.

A key differentiator for the MS in MQS program at Purdue is its strong integration with the unique theoretical strength and expertise from The College of Science and especially the Department of Statistics. This provides a balanced curriculum that emphasizes both technical rigor and real-world applicability, whereas the other programs appear to be more application-driven.

There is substantial market demand for candidates who are not only users of AI and data science tools, but also builders who *understand how such tools are developed and can be adapted to domain-specific challenges*. A solid grasp of the underlying technical foundations enables graduates to keep pace with future waves of technological evolution, which continue to unfold rapidly and unpredictably in the current AI landscape.

c. Provider Market Analysis: Similar Programs' Output, Growth, and Market Share

- In relation to the student interest and demand information under (5.a.), cite the most recent authoritative completion data of the programs identified under (5.b.) to assess the maturity of the market and demonstrate whether it is trending upward, downward, or stable. Why does the institution believe it can enter the market to reach viable enrollment/completions under (5.d.)?

There were 5,854 combined master's degree completions in the fields related to this MS degree program (Data Science, General (30.7001); Actuarial Science (52.1304); Applied Statistics, General (27.0601); Data Analytics, General (30.7101); *Lightcast Program Overview Reports run in October 2025, Q4 2025 Dataset*).

Field (CIP Code)	Completions in 2024	Growth in completions, 2020-2024
Actuarial Science (CIP 52.1304)	232	-47%
Applied Statistics (CIP 27.06)	369	184%
Data Science, general (CIP 30.7001)	4322	2,725%
Data Analytics (CIP 30.7101)	931	958%
Data Science, other (CIP 30.7099)	6	500%

The top five institutions for each CIP code are in the table below, with additional information in Appendix 5.

Field (CIP Code)	Institution	Master's degree completions (2024)	Growth % Year-Over Year
Actuarial Science (CIP 52.1304)	UCLA	89	14.1%
	Georgia State Univ.	30	-6.3%
	Boston University	19	-32.1%
	Columbia University in the City of New York	18	-60.0%
	Univ. Illinois at Urbana-Campaign	15	-6.3%
Applied Statistics (CIP 27.06)	Univ. Michigan-Ann Arbor	71	-23.7%
	Johns Hopkins Univ.	58	383.3%
	Colorado State Univ.-Fort Collins	32	68.4%
	University of Kansas	28	0.0%
	Arizona State Univ. Digital Immersion	28	180.0%
Data Science, general (CIP 30.7001)	Eastern University	664	41.9%
	University of North Texas	334	Insufficient data
	Columbia University in the City of New York	203	-15.4
	New Jersey Institute of Technology	201	32.2%
	University of Texas at Austin	174	107.1
Data Analytics (CIP 30.7101)	University of Chicago	246	-2.0%
	Westcliff University	82	127.8%
	Concordia University-Saint Paul	68	1600%
	University of Houston-Downtown	58	5.5%
	Virginia Commonwealth University	47	4.4%

Conferrals in 2024 varying by discipline/CIP code, with Data Science (30.7001) having the strongest numbers. Purdue University's is strongly positioned in data science, statistics, and AI, including the growth in the BS in Data Science. Relationships associated with the development of this program will help drive enrollment – with Eli Lilly for Applied Statistics, with various insurance companies for Quantitative Finance, Insurance, and Risk Management, and with the Sport Management program for Data Science. The Indianapolis location will also be

an asset to attract students, with access to corporate partners and prospective employers in the area. We have set practical and attainable goals for enrollment, as noted below. These enrollment projections are for the program as a whole, for the three different majors.

Appendix 5: In addition to a narrative analysis above, include the most recent data for the applicable programs' completions, growth trends, and market share data, such as the most recent IPEDS or Lightcast data. (This appendix should contain graphs/tables, relevant pages from the analyses, and/or links to cited sources.)

d. Projected Enrollment/Completions and Threshold Viability

- The proposal must demonstrate a realistic pathway for the degree program to reach viability in terms of the three-year rolling average for degree conferrals required under IC 21-18-9-10.7 after the program exits its corresponding 'Ramp Up Period' by degree type.
- As required under IC 21-18-9-5(b), explain the basis for the projected enrollment and degree conferral figures; the projected completion rate must be provided.
- Replicating the corresponding degree type-specific table template below, insert a completed table with multi-year projections for headcount, FTE enrollment (rounded to the nearest whole number), and degrees conferred in a manner consistent with the Commission's student data reporting and collection procedures. Specify the rolling average of degree conferrals for the final three-year period under analysis.
 - If applicable, provide a table for each campus at which the program will be offered
 - If the program is offered at more than one campus, e.g., an online multicampus collaborative, a summary table, which reports the total headcount and FTE enrollments and degrees conferred across all locations, must be provided.

At the direction of the Provost, a specialized cross-functional task force was established in fall 2025 to standardize our institutional enrollment projection strategy, drawing on high-level expertise from the Office of the Provost, Purdue Online, Purdue Global, IDA+A (Institutional Data Analytics and Assessment), and Enrollment Management. The established methodology utilizes "Program Enrollment Projections Formula" that balances quantitative data with qualitative interpretation and draws on guidance and recommendations from ICHE.

The quantitative component of the projection utilizes three primary data pillars:

- **Conferral Data at Competitor Institutions:** Utilizing tools like Lightcast, the university analyzes total graduates from similar programs nationally and regionally to assess the total addressable market and the competitive landscape.
- **Search Volume Analytics:** By leveraging Google Search Volume Analytics and search engine data, the team identifies real-time student demand and interest levels for specific program keywords, providing a prospective look at market appetite.
- **Past Program Performance:** Historical enrollment and growth data from similar programs at Purdue are used to benchmark realistic growth trajectories over a standard eight-year "ramp-up" period.

Strategic Qualitative Interpretation: The final projections are refined through a qualitative "Indicator Pyramid" that assesses the program's unique strategic advantages. This includes evaluating market competition levels (avoiding saturated markets), pricing strategies relative to peer R1 institutions, and the evolution of required skills in the labor market. The methodology also accounts for "Pipelines"—such as the proposed BS+MS pathway—and strategic partnerships with Indiana-based companies or entities that act as guaranteed enrollment drivers.

che.IN.gov

Master's Degree Enrollment Projections	7-Year "RAMP-UP PERIOD"							
	1 st FY	2 nd FY	3 rd FY	4 th FY	5 th FY	6 th FY	7 th FY	8 th FY
	2027-8	2028-9	2029-30	2030-1	2031-2	2032-3	2033-4	2034-5
Enrollment Projections (Headcount)								
Full-time	18	27	32	36	36	45	45	45
Part-time	2	3	3	4	4	5	5	5
TOTAL	20	30	35	40	40	50	50	50
Enrollment Projections (FTE)								
Full-time	18	27	32	36	36	45	45	45
Part-time	1	1.5	1.5	2	2	2.5	2.5	2.5
TOTAL	19	28.5	33.5	38	38	47.5	47.5	47.5
Degree Conferred Projection	14	21	25	29	29	36	36	36
						Three-year Average of graduates		
						36		
Projected Completion Rate: 75%								
Proposed Degree Program: M.S. in Multidisciplinary Quantitative Sciences								
CIP Code: 30.7099								

6. Program of Study: Curriculum, Quality, and High-Impact Practices

a) Required Credit Hours and Coursework

- Specify the credit hours required for the proposed program.
 - If the associate or baccalaureate degree program exceeds 60 or 120 semester credit hours, respectively, the institution must summarize the reason for exceeding this standard expectation under IC 21-18-9-8(d).

30 credits

Appendix 6: Exceeding the Standard Expectation of Credit Hours, Detail (This appendix, if necessary, should contain detailed information on why it is necessary to exceed the standard credit hour expectation, such as links to relevant licensure and/or accreditation standards.)

- Provide an overview of the degree's course requirements, including a list of required core courses and prescribed/restricted electives by area, if applicable. Include short course descriptions and, if necessary, notations for new courses or courses needing to be developed.

The program has two core courses, one offered in fall and one offered in spring, that students in the three majors will take. The program has 15 additional courses. Three of these 14 courses are options for all three majors, and three other of these 14 courses are options for two of the three majors. This allows for interdisciplinary learning and interaction of students in this programs, and adds to the efficiency of delivering this program.

At-a-glance distribution of the 17 courses across the majors

Prefix	Number	Course title	Data Science major	Applied Statistics major	QFIRM major
STAT	509	Foundations and Advances in Statistics	CORE	CORE	CORE
STAT	512	Applied Regression Analysis	Selective	Selective	Major Req
STAT	514	Design Of Experiments	Selective	Major Req	Other
STAT	520	Time Series And Applications	Selective	Major Req	Other
STAT	522	Sampling and Survey Techniques	Selective	Major Req	Other
STAT	525	Intermediate Statistical Methodology (Linear Models)	Other	Major Req	Other
STAT	529	Applied Decision Theory And Bayesian Statistics	Other	Major Req	Other
STAT	534	Simulation for Data Science	Major Req	Other	Selective
STAT	535	Case Studies in Statistical Programming with R and Python	CORE	CORE	CORE
STAT	540	Computational Finance I	Other	Other	Major Req
STAT	550	Quantitative Risk Management	Other	Other	Major Req
STAT	556	Causal Inference	Other	Major Req	Other
STAT	583	Reinforcement Learning for Applications in Statistics and Data Science	Major Req	Selective	Selective

STAT	587	Machine Learning in Finance and Insurance	Other	Other	Major Req
CIT	526	Applied Data Analytics	Major Req	Other	Other
CS	587	Foundations of Deep Learning	Major Req	Selective	Selective
ECE	570	Artificial Intelligence	Major Req	Selective	Selective

Details on each major

Data Science major

	Credits	Fall	Spring
Core program requirements	6	Foundations and Advances in Statistics - STAT 50900 Case Studies in Statistical Programming with R and Python – STAT 53500	
Data Science major required courses – take <u>at least four</u> of these five courses	12-15	Simulation for Data Science – STAT 53400 Applied Data Analytics – CIT 52600 Foundations of Deep Learning – CS 58700 Artificial Intelligence – ECE 57000	Reinforcement Learning for Applications in Statistics and Data Science - STAT 58300 Artificial Intelligence – ECE 57000
Data Science selectives - take <u>at least one</u> of these four courses	3-9	Design Of Experiments - STAT 51400 Sampling and Survey Techniques – STAT 52200	Time Series And Applications - STAT 52000 Applied Regression Analysis – STAT 51200
Other available program selectives The remainder of the 30 credits can be fulfilled with these courses		Quantitative Risk Management – STAT 55000	Intermediate Statistical Methodology (Linear Models) - STAT 52500 Causal Inference - STAT 55600 Applied Decision Theory And Bayesian Statistics - STAT 52900 Computational Finance I – STAT 54000 Machine Learning in Finance and Insurance – STAT 58700

Applied Statistics major

	Credits	Fall	Spring
Core program requirements	6	Foundations and Advances in Statistics - STAT 50900 Case Studies in Statistical Programming with R and Python – STAT 53500	
Applied Statistics major required courses –	12-18	Design of Experiments - STAT 51400	Time Series and Applications - STAT 52000

take <u>at least four</u> of these six courses		Sampling and Survey Techniques – STAT 52200	Intermediate Statistical Methodology (Linear Models) - STAT 52500 Causal Inference - STAT 55600 Applied Decision Theory And Bayesian Statistics - STAT 52900
Applied Statistics selectives – take <u>at least one</u> of these four courses	3-9	Foundations of Deep Learning – CS 58700 Artificial Intelligence – ECE 57000	Applied Regression Analysis – STAT 51200 Artificial Intelligence – ECE 57000 Reinforcement Learning for Applications in Statistics and Data Science - STAT 58300
Other available program selectives The remainder of the 30 credits can be fulfilled with these courses		Quantitative Risk Management – STAT 55000 Applied Data Analytics - CIT 52600	STAT 53400 - Simulation for Data Science Computational Finance I – STAT 54000 Machine Learning in Finance and Insurance – STAT 58700

Quantitative Finance, Insurance, and Risk Management (QFIRM) major

	Credits	Fall	Spring
Core program requirements	6	Foundations and Advances in Statistics - STAT 50900 Case Studies in Statistical Programming with R and Python – STAT 53500	
QFIRM major required courses – take these <u>four</u> courses	12	Quantitative Risk Management – STAT 55000	Applied Regression Analysis – STAT 51200 Computational Finance I – STAT 54000 Machine Learning in Finance and Insurance – STAT 58700
QFIRM major selectives – take <u>at least three</u> of these four courses	9-15	Simulation for Data Science – STAT 53400 Foundations of Deep Learning – CS 58700 Artificial Intelligence – ECE 57000	Artificial Intelligence – ECE 57000 Reinforcement Learning for Applications in Statistics and Data Science - STAT 58300
Other available program selectives The remainder of the 30 credits can be fulfilled with these courses		Design of Experiments - STAT 51400 Sampling and Survey Techniques – STAT 52200 Applied Data Analytics – CIT 52600	Time Series and Applications - STAT 52000 Intermediate Statistical Methodology (Linear Models) - STAT 52500 Causal Inference - STAT 55600 Applied Decision Theory And Bayesian Statistics - STAT 52900

b) Accelerated Delivery Options

- As required under IC 21-18-9-5(b), specify and describe whether the proposed course of study provides options for accelerated delivery, if applicable, such as a structured 'Degree-in-3' baccalaureate, dual degrees, or an accelerated master's program (3+2 or 4+1).

With establishment of this MS program, we would next be able to establish a BS+MS program option allows current undergraduate students at Purdue complete both their bachelor's and master's degrees in as little as five years. Undergraduates in a variety of bachelor's degree majors can begin taking graduate-level courses for the Multidisciplinary Quantitative Sciences program during their senior year, integrating seamlessly into their MS-level study. The BS+MS option is available to undergraduates at both the West Lafayette and Indianapolis campuses.

c) Opportunities for Credit for Prior Learning

- As required under IC 21-18-9-5(b), list and describe all opportunities to earn credit for prior learning (CPL) at a college-level through military experience and prior workforce/professional experience. Briefly explain how prospective and entering students will be informed of these opportunities. (Insert or link to the proposing institutions' applicable certification CPL crosswalks, Joint Service Transcript CPL crosswalks, Indiana Collegiate Purple Star information, if applicable, and/or policies on CPL individual assessments or CPL portfolio reviews.)

An opportunity for credit for prior learning could be available for students who have completed one of Purdue University's online post-baccalaureate certificates, such as data science or artificial intelligence. Faculty advisors will review students' academic work as part of this certificate, and recommend on a case-by-case basis what courses might count toward the MS degree.

As a Purple Star-designated institution, Purdue University is committed to supporting veterans and service members. The Veterans and Military Success Center (VMSC) provides specialized support to help military learners translate their experience into academic credit.

- Joint Services Transcript (JST) Review: Students can earn credit for military training and experience by submitting their Joint Services Transcript or Community College of the Air Force (CCAF) transcripts.
- ACE Recommendations: Purdue typically follows the American Council on Education (ACE) recommendations for evaluating military training for college-level credit.
- Military Success Coaches: Dedicated success coaches work with military learners throughout their study to assist with the transition to the civilian workforce and ensure all eligible military credits are applied.

d) Opportunities for Embedded, Stackable Credentials and Degrees

- As required under IC 21-18-9-5(b), list and describe all embedded, stackable credentials or degrees a student can readily earn within the course of study, including microcredentials, credit-bearing certificates, and industry-recognized credentials. Briefly describe their learning outcomes and currency. (Link to any applicable websites for these credentials/degrees.)

There currently are not any stackable credentials that articulate into this program. In the future, we aim to create a data science certificate for students pursuing the MS in Sport Management, to enhance their data analytics credentials.

e) Work-Based Learning and/or Experiential Learning Requirement

- As required under IC 21-18-9-5(b), specify whether the proposed program of study requires a work-based learning or experiential learning experience, yes or no?

Work-Based Learning Requirement	Yes ☐	No ☒
Experiential Learning Requirement	Yes ☐	No ☒

- If applicable, describe the necessary course(s), credit hours, work/practica/clinical hours, and other requirements. Specify how these opportunities will connect students with employment opportunities and/or further education (graduate/professional school).

- If there are no such requirements, briefly explain why not and how students will still have opportunities to engage in work-based or experiential learning.

While the program does not require work-based or experiential learning, the course "Case Studies in Statistical Programming with R and Python" with emphasize practical learning. Additionally, interested students will have ample opportunity for experiential learning, within structured courses and beyond in independent study experiences, with mentorship from faculty and/or industry partners.

f) Capstone Course(s) and High-Impact Practices

- Does the proposed program require students to complete a capstone course or capstone sequence which provides a structured, culminating experience for their learning, such as a major project or thesis?

Yes ☐	No ☒	Not Applicable (N/A) ☐
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- Identify and briefly describe any evidence-based 'High-Impact Practices' incorporated into the curriculum of the proposed degree program, such as a first-year experience, capstone course or capstone sequence, seminars, and undergraduate research.

Not applicable

g) Career Readiness and In-Demand Transferrable Skills

- Describe student engagement and instructional experiences with career relevance that place an emphasis on developing multiple career readiness competencies and in-demand transferable skills. For example, does the curriculum incorporate career exploration and preparation courses?

Students engage in industry-framed projects, capstones, and optional internships that mirror real workflows in AI/ML/Statistics, emphasizing problem framing, experimentation, version control, collaborative coding, and cloud-based deployment. Team-based work develops leadership, project management, and cross-functional collaboration. Regular employer talks, practitioner critiques, and alumni mentoring expose students to roles across data science, applied statistics, and quantitative finance/risk.

h) Assessment

- Summarize how the institution intends to assess students with respect to mastery of proposed program's learning outcomes (competencies, skills, knowledge, and experiences) listed under (3.b.).

The approach to assessment is multifaceted, moving from individual course performance to programmatic mastery:

- Students practice new learning through formative assessments, including homework, class activities, and group collaboration. Mastery is subsequently measured via summative examinations aligned with both course-level objectives and the six core program-level outcomes.
- Given the multidisciplinary nature of the program, many courses incorporate authentic projects. These allow students to demonstrate technical proficiency in AI, statistical foundations, and data engineering by solving industry-framed problems.
- While the program does not require a traditional thesis, it utilizes "High-Impact Practices" such as industry-defined capstones and experiential learning in the Data Mine. These experiences are evaluated based on the student's ability to produce deployable models or decision tools.

Purdue maintains a rigorous quality assurance cycle to ensure the curriculum remains relevant to the shifting technological landscape, in adherence with HLC guidance and

- Course- and program-level outcomes are regularly reviewed to ensure continued alignment with the overarching goals of the College of Science.
- To maintain high standards, course designs follow a three-year cadence, ensuring content is up-to-date and reflects the latest developments in AI and quantitative sciences.
- All students complete summative teaching evaluations administered by the Center for Instructional Excellence (CIE) to provide data on instructional effectiveness.
- In coordination with IDA+A, the institution monitors post-graduation outcomes and solicits alumni feedback to inform continuous improvement efforts.

i) Accreditation/Certification

- Other than the Higher Learning Commission, is there an applicable programmatic accrediting/certifying body (or bodies) for this course of study? (If yes, link to the relevant curricular and programmatic standards of the accreditor(s).)

Yes ☐	No ☒	If yes, specify:
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- In reference to external input on program design under (3.a.), was the program of study developed in alignment with the standards of an applicable programmatic accrediting/certifying body (or bodies) specified above? If yes, specify the body and corresponding standards.

Yes ☐	No ☐	Not Applicable (N/A) ☒
If yes, specify:		

- Will the program be seeking programmatic accreditation/certification, if applicable? If yes, specify the accrediting body and anticipated timetable. If not, explain why.

Yes ☐	No ☒	Not Applicable (N/A) ☐
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j) Artificial Intelligence (AI) Fluency and Competency

- Explain how the program of study intentionally incorporates Artificial Intelligence (AI) to optimize the learning experience as well as prepare graduates for the shifting nature of work.

A strong grasp of AI is foundational for quantitative scientists. Accordingly, the MS in Multidisciplinary Quantitative Sciences embeds AI across the core and majors, covering supervised and unsupervised learning, deep learning, foundation models, and causal/forecasting methods alongside statistical inference. Students practice end-to-end AI delivery—data pipelines, model training, validation, monitoring, and documentation. Assessments require students to disclose and critically evaluate any AI assistance to build reflective, workplace-ready practice.

Additionally, beginning in 2026, Purdue will establish college-based AI Advisory Boards across the university. A key goal of this initiative is to strengthen the feedback loop between industry partners and the faculty and staff designing and delivering curriculum. The input and feedback shared will ensure that courses in this new program are enhanced and innovated in response to the shifting nature of work and industry demands.

k) Licensure and Certification

Graduates of this program will be prepared to earn the following:

State License:	
National Professional Certifications (including the bodies issuing the certification):	<i>selected Society of Actuaries exams</i>
Third-Party Industry Certifications (including the bodies issuing the certification):	

The Quantitative Finance, Insurance, and Risk Management (QFIRM) major helps students to prepare for the statistical topics covered in the Society of Actuaries' (SOA) exams, such as topics covered by the Statistics for Risk Modeling exam (part of the Actuarial I series) and the Predictive Analytics exam (part of the Actuarial I series). Additionally, the QFIRM major also complements existing topics in the SOA exam system with the emerging AI-powered analytic methods, thus helping graduates of this program gain differential advantages and distinguishing themselves from their peers in this era of rapid evolving AI-based analytics.

l) Defined Pathways for Certain Student Populations

- As required under IC 21-18-9-5(b), provide defined degree map pathways for the following student populations, contemplating how long a full-time and part-time student, as applicable, will need to complete the program:
 - High School
 - Returning
 - Adult (assume part-time)
 - High School
 - High school students are not eligible for the program, as a bachelor's degree is a prerequisite to be eligible.

- It would take between 1-4 years for such students to earn their bachelor's degree, and then 2-3 semesters as full-time MS students (12-15 credits per semester) or 5-6 semesters at part-time (assuming part-time MS students (6 CR each semester).
- Returning
 - Returning students would need to complete a bachelor's degree to be eligible for enrollment for this program.
 - It would take between 1-4 years for such students to earn their bachelor's degree, and then 2-3 semesters as full-time MS students (12-15 credits per semester) or 5-6 semesters at part-time (assuming part-time MS students (6 CR each semester).
- Adult (assume part-time)
 - Adult students are one target audience for this degree program. We assume adults with a B.S. will graduate in 5 semesters, enrolling in 6 CR per semester.
 - The program allows for online course engagement that adult students can leverage in summer terms. For a residential program, up to 25% of credits can be taken online, allowing the flexibility for adult students in this program to take up to two online 3-credit courses.

Appendix 7: Degree Maps by Each of the Specified Student Populations, Detail (This appendix should contain the semester-by-semester, course-level detail on the program curriculum, including how long it will take to complete the program, assuming full-time or part-time study, as applicable.)

m) Transfers from Two-year Institutions: Articulation Agreements

- ****All institutions proposing baccalaureate degrees must address program articulation pathways, such as the Indiana College Core and/or a Transfer Single Articulation Pathway (TSAP).****
- For each articulation agreement, indicate how many of the associate degree credits will transfer and apply toward the baccalaureate program.

Not applicable

Appendix 8: Articulation of Associate/Baccalaureate Programs, Detail (This appendix should contain the actual articulation agreements relevant to the proposed program. Prior to submitting the program proposal to the Commission, universities should work directly with Ivy Tech Community College and Vincennes University to develop articulation agreements that maximize transfer opportunities for students.)

7. Programmatic Costs

a. Fiscal Support

- Characterize the budgeting source to launch and sustain this program followed by a brief explanation of the context:

New ☐	Existing ☒	Reallocated ☒
------------------------------	--	---

- Summarize any recent reallocation of resources to support this program, including any eliminated or downsized programs to provide resources for this program?

We will be using existing resources, and envision that after ramp-up, that this MS in Multidisciplinary Quantitative Sciences will be self-supporting. In terms of use of existing resources, we have thoughtfully

evaluated programs, including programs that fall below or near the state's enrollment thresholds, and programs that had opportunity to evolve and be redesigned and/or to be developed from a foundation of existing courses. This created opportunity for different uses of faculty time support of courses and programs, pivoting to instruction needs that have higher demand and greater opportunity for growth.

- Elaborate on any innovative fiscal strategies to sustain this program.

We are committed to keeping an active eye on creative opportunities to sustain this program, with progress into the ramp-up period. These opportunities could include creating certificate programs based on portions of the program's content, and partnerships with corporations that could be interested in the program as a whole or certain portions of content (such as in these certificates). One specific example would be a certificate designed for those interested sport management – both students in Purdue's MS in Sport Management and working professionals in the sport management field – to enhance their programming, data analytics, and AI skills.

b. Cost to Operate and Per Student Cost

- As required under IC 21-18-9-5(b), provide the projected cost to operate the proposed degree program, including the estimated cost per FTE student in the program. How does this compare to similar programs at other state educational institutions?

The projected cost to operate this program ranges from \$357,750 in Year 1 to \$695,878 in Year 8, with the increase in expenditures coupled with projected enrollment growth, and hiring additional instructional and student support personnel to support increased enrollment. The average cost per student FTE over Year 1 to Year 8 is estimated to be \$19,741.

It is difficult to get the actual current operational costs from other institutions, but tuition costs are a reasonable approximation. Available tuition information on other Indiana institutions that were noted above in Section 5b (*Market Inventory*, identified by "[TransferIN Indiana](#)" *Academic Program Inventory* with relevant CIP codes):

[Saint Mary's College](#) – \$53,934 tuition

[Butler University](#) – \$25,500 (based on \$850/credit and 30 credits)

[Ball State University](#) – \$13,920 Indiana resident (based on 30 credits at \$464/credit), \$38,070 non-resident (based on 30 credits at \$1269/credit)

[Indiana University](#) - \$11,090 Indiana resident, \$30,792 non-residents for tuition and mandatory fees

Appendix 9: Operating Cost Budgeting Estimates (This appendix should contain budgeting estimates and the per student cost. Comparisons to similar degree programs at other state educational institutions should draw from the Commission's 'Data Accountability and Transparency Dashboard' under IC 21-14-15-1.)

c. Faculty and Staff

- Of the faculty and staff required to offer this proposed program, how many are preexistent and how many will need to be added (express both in terms of number of full- and part-time faculty, including title and

status, such as non-tenure track)? Specify whether the proposed program will utilize adjunct or clinical faculty, such as industry experts and practitioners.

Seven existing faculty in the Department of Statistics will be supporting this program; five are tenure-track and two are non-tenure track. There is a current search for an additional non-tenure track faculty member specifically to support this program (Purdue Req Id: 39300).

Appendix 10: Faculty and Staff, Detail (This appendix should contain a list of faculty with appointments to teach in the program and a brief description of new faculty positions yet to be filled.)

d. Physical Plant and Capital Equipment Costs

- Summarize physical plant and capital equipment cost requirements to successfully launch and deliver the proposed program, such as renovations to existing facilities, requests for new capital projects (including a reference to the institution's capital plan, if applicable), the leasing of new space, and/or the purchase of needed equipment.

The Purdue University Director of Space Administration is actively planning for all the university's academic programs in Indianapolis. The College of Science has identified space in either the Engineering, Science & Technology Building or the Engineering/Technology Building as optimal spaces for the faculty, staff, and students involved in this program. No extensive renovations are needed.

Appendix 11: Capital Costs, Detail. (If necessary, this appendix should contain additional information on capital costs to successfully launch and deliver the proposed program.)

e. Collaborative Support and Curricular Synergies

- Identify programs at the proposing institution that overlap, complement, strengthen, or otherwise would be impacted by the proposed program, such as potentially cannibalizing enrollment or, conversely, providing opportunities to leverage interdisciplinary assets, curricular synergies, and the pooling of resources.

There is an online MS in Applied Statistics with Purdue University Online. However, this online program and this proposed new multidisciplinary program to be based in Indianapolis target very different student audiences. The online Applied Statistics program primarily targets students who are currently working, and with to continue working while pursuing this MS degree on a parttime basis.

- Target audiences - The online Applied Statistics program primarily targets students working adults who will continue working while pursuing this MS degree on a parttime basis. We expect most students in the MS in Multidisciplinary Quantitative Sciences program to be fulltime. While it will be possible for students to be parttime to pursue this one of these new MS degrees as part of the MS in Multidisciplinary Quantitative Sciences, we expect this will be the minority of the students in this program.
- Modality – online versus residential in Indianapolis
- Curriculum – The online MS in Applied Statistics is focused purely on applied statistics. The MS in Multidisciplinary Quantitative Sciences encompasses three majors, with nine of the 30 credits being core courses, and then more specialized courses for the three majors.

That said, there are curricular synergies and a pooling of resources will be possible, with two courses that are part of the online Applied Statistics program that overlap with the residential MS. Students in the MS in Multidisciplinary Quantitative Sciences would have the option to take these courses online if they wish, being allowed to take up to six credits online.

There also is a pooling of personnel resources, with faculty able to teach for both the online program and the residential program.

- Indicate any collaborative arrangements in place or planned to support the program, such as multicampus arrangements or inter-institutional agreements. Please provide details on estimated cost savings and/or other benefits in relation to (7.b.) above.

Not applicable.

8. External Letters of Support (Minimum of 5)

- List, by source, the five or more external letters received in support of the proposed degree program.
 - 1) Toby Hall, Executive Vice President and Chief Information Officer, Delta Dental of Michigan, Ohio, and Indiana
 - 2) Yongming Qu, Vice President in Statistics, Data and Analysis, Eli Lilly and Company
 - 3) Everette Mills, Vice President of Product Management, GrayHair Software, LLC
 - 4) Haoda Fu, Head of Exploratory Biostatistics, Amgen, and Adjunct Full Professor of Biostatistics and Health Data Sciences, Indiana University School of Medicine
 - 5) Yuanyuan Li, Senior Research Scientist, Munich Re
 - 6) Carla Gilson, Senior Associate Athletics Director, Sports Performance and Wellness, Purdue University Athletics
 - 7) Jeanne Boyd, Executive Director, Sport Management, Purdue University, Department of Health and Kinesiology
 - 8) Wooing Sun Lee, CEO, SK Hynix Semiconductor West Lafayette LLC
 - 9) Kevin O'Connor, Leadership Development Associate, Fire Modeling Development and Research, State Farm
 - 10) Chris Kuo, Director of Data Science & Analysis, The Hartford Insurance

The letters should address the strong workforce and/or societal need for graduates in this field of study, how the proposed curriculum aligns with current and future talent needs, and the various career opportunities for graduates, especially in Indiana. The Commission particularly values original letters from external stakeholders that were directly involved in the genesis and/or development of the proposed program, including those with formalized relationships with the institution, e.g., an employer advisory board or regular employer of interns or graduates. Ideal submitters will be impacted by the program's graduates, such as in-state employers (including local, state, or federal government), business and industry organizations, economic development entities, non-profit organizations, philanthropies, professional organizations, and graduate/professional schools.

Appendix 12: Letters of Support, Detail (This appendix should contain a minimum of five letters of support for the program.)

APPENDICES

Appendix 1: Provide the list of occupations and occupational classifications relevant to the proposed degree program. Provide analyses of the most recent regional/Indiana job posting analytics. (This appendix should contain the detailed tables and/or relevant pages from the analyses.)

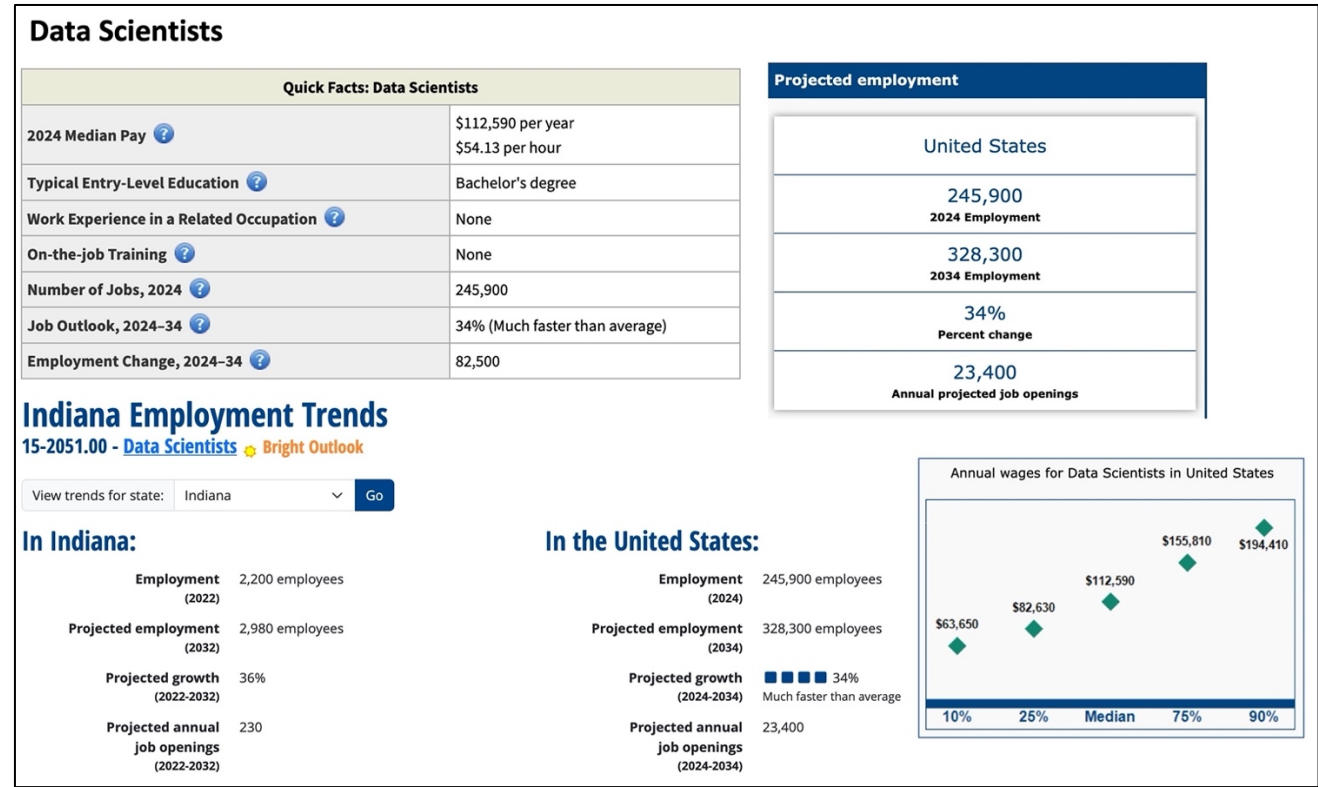
- The 27 different job titles in the table below were listed as "Top Posted Job Titles" in Lightcast Program Overview reports with CIP codes relevant to this program (30.7001, Data Science, General; 30.7099, Data Science, Other; 30.7101, Data Analytics, General; 52.1304, Actuarial Science; 27.0601, Applied Statistics, General; 26.1102 Biostatistics), or were suggested by faculty who have had students hired into certain positions/job titles with relevant industries.
- [O*NET OnLine](#) was searched with these job titles to identify Standard Occupational Classification (SOC) codes associated with each job title.
- Employment data for the major groupings relevant to this degree program were obtained from [CareerOneStop](#), and are presented in the main text in Section 3d.

Job titles relevant to the proposed program*	Standard Occupational Classification (SOC) codes associated with the job title (www.onetonline.org)
Actuarial Scientist	15-2011 - Actuary
Advanced Analytics Analyst	15-2031.00 - Operations Research Analyst 15-2051.01 - Business Intelligence Analyst, under the broader category of Data Scientists (15-2051) 15-2051.00 - Data Scientist
Advanced Analytics Consultant	15-2051.00 - Data Scientist
Analytics Manager	13-1111 - Management Analyst 11-3021 - Computer and Information Systems Manager 15-2051.00 - Data Scientist 15-2051.01 - Business Intelligence Analyst,
Business Analyst/Project Manager	13-1082 - Project Management Specialist 13-1111 - Management Analyst 15-2051.01 - Business Intelligence Analyst 13-1199 - Business Operations Specialists, All Other
Business Intelligence Analyst	15-2051.01 - Business Intelligence Analyst
Business / Management Analyst	13-1111 - Management Analysts, under the broader category of Business and Financial Operations Occupations (13-0000)
Business Process Consultant	13-1111 - Management Analyst
Clinical Analyst / Clinical Documentation and Improvement Specialist	15-2051.02 - Clinical Data Manager 15-1211.01 - Health Informatics Specialists 29-9021 - Health Information Technologists
Clinical Data Systems Specialist / Manager	15-2051.02 - Clinical Data Manager 15-1211.01 - Health Informatics Specialist
Computer Systems Engineer / Architect	15-1299.08 - Computer Systems Engineers/Architect, under 15,1299, Computer Occupations, All Other
Data Analyst	15-2051.00 - Data Scientist 15-2041 - Statisticians 15-1211 - Computer Systems Analyst
Data Analytics Analyst	15-2051.00 - Data Scientist 15-2051.01 - Business Intelligence Analyst 15-1211 - Computer Systems Analyst
Data Scientist	15-2051.00 - Data Scientist
Data Science Manager	11-3021 - Computer and Information Systems Managers

	15-2051 - Data Scientist
Enterprise Architect	15-1299.08 - Computer Systems Engineers/Architect 15-1241 - Computer Network Architects 15-1243 - Database Architects
Machine Learning Engineer	15-1299 - Computer Occupations, All Other 15-2051.00 - Data Scientist 15-1252 - Software Developers
Management Analyst	13-1111 - Management Analysts
Market Research Analyst	13-1161.00 - Market Research Analysts and Marketing Specialists
Model Validation Analyst	13-2051.00 - Financial and Investment Analysts 13-2054.00 - Financial Risk Specialists.
Pharmacovigilance Specialist	19-5011.00 - Occupational Health and Safety Specialist
Program Management Officer	11-3021 - Computer and Information Systems Manager 13-1082 - Project Management Specialist Other occupations in Major Group 11-0000 Management Occupations , or 13-0000 Business and Financial Operations Occupations
Quantitative Model Analyst	13-2099.01 - Financial Quantitative Analysts
Simulation Specialist	15-1299 - Computer Occupations, All Other
Financial/insurance/data science consultants	13-2051.00 - Financial and Investment Analysts
Risk analysts	13-2054 - Financial Risk Specialists 13-2041 - Credit Analysts 13-2051 - Financial Analysts 15-1212 - Information Security Analysts
Investment and/or risk management quantitative analysts	13-2099.01 - Financial Quantitative Analysts 13-2051 - Financial Analysts
Climate risk modelers	15-2051.00 - Data Scientist 15-2099.00 - Mathematical Science Occupations, All Other

Appendix 2: In addition to the narrative and questions above for (3.f.), provide a summary of Indiana DWD data and ‘Top Jobs’ occupational rankings, U.S. BLS data, O*NET data, proprietary tools like Lightcast or Gray DI, etc. (This appendix should contain the detailed tables addressing occupation/occupational-specific details as well as applicable industry sector(s) projections on percentage growth, relative growth to average occupational growth, and the absolute employment change, upon which the narrative summary of future labor market demand is based including Indiana-specific information and/or relevant pages from the analyses.)

The figures below are aggregated information from two websites – the [U.S. Bureau of Labor Statistics Occupational Outlook Handbook](#), and [CareerOneStop](#) -- for five of the occupation categories relevant to the MS in Multidisciplinary Quantitative Sciences. These data demonstrate **very strong job and wage outlooks for graduates of this program:**



Sources: www.bls.gov/ooh/math/data-scientists.htm
www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Data%20Scientists&location=United%20States&onetcode=15-2051.00

Actuary

Quick Facts: Actuaries	
2024 Median Pay ?	\$125,770 per year \$60.47 per hour
Typical Entry-Level Education ?	Bachelor's degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	Long-term on-the-job training
Number of Jobs, 2024 ?	33,600
Job Outlook, 2024–34 ?	22% (Much faster than average)
Employment Change, 2024–34 ?	7,300

Projected employment
United States
33,600 2024 Employment
40,900 2034 Employment
22% Percent change
2,400 Annual projected job openings

Indiana Employment Trends

15-2011.00 - Actuaries 🔥 Bright Outlook

View trends for state: Indiana Go

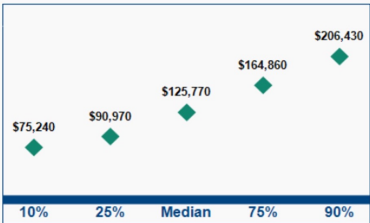
In Indiana:

Employment (2022)	190 employees
Projected employment (2032)	240 employees
Projected growth (2022-2032)	26%
Projected annual job openings (2022-2032)	20

In the United States:

Employment (2024)	33,600 employees
Projected employment (2034)	40,900 employees
Projected growth (2024-2034)	22% Much faster than average
Projected annual job openings (2024-2034)	2,400

Annual wages for Actuaries in United States



Sources: <https://www.bls.gov/ooh/math/actuaries.htm>
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Actuaries&onetcode=15201100&location=indiana>

Operations Research Analyst

Quick Facts: Operations Research Analysts	
2024 Median Pay ?	\$91,290 per year \$43.89 per hour
Typical Entry-Level Education ?	Bachelor's degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	None
Number of Jobs, 2024 ?	112,100
Job Outlook, 2024–34 ?	21% (Much faster than average)
Employment Change, 2024–34 ?	24,100

Projected employment
United States
112,100 2024 Employment
136,200 2034 Employment
22% Percent change
9,600 Annual projected job openings

Indiana Employment Trends

15-2031.00 - Operations Research Analysts 🔥 Bright Outlook

View trends for state: Indiana Go

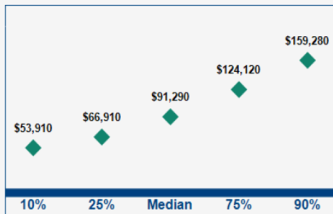
In Indiana:

Employment (2022)	1,500 employees
Projected employment (2032)	1,860 employees
Projected growth (2022-2032)	24%
Projected annual job openings (2022-2032)	140

In the United States:

Employment (2024)	112,100 employees
Projected employment (2034)	136,200 employees
Projected growth (2024-2034)	22% Much faster than average
Projected annual job openings (2024-2034)	9,600

Annual wages for Operations Research Analysts in United States



Sources: <https://www.bls.gov/ooh/math/operations-research-analysts.htm>
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Operations%20Research%20Analysts&onetcode=15-2031.00&location=indiana>

Statistician

Quick Facts: Mathematicians and Statisticians

2024 Median Pay ?	\$104,350 per year \$50.17 per hour
Typical Entry-Level Education ?	Master's degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	None
Number of Jobs, 2024 ?	34,600
Job Outlook, 2024-34 ?	8% (Much faster than aver
Employment Change, 2024-34 ?	2,700

Projected employment

United States
32,200 2024 Employment
34,900 2034 Employment
9% Percent change
2,000 Annual projected job openings

Indiana Employment Trends

15-2041.00 - Statisticians ⭐ Bright Outlook

View trends for state: Indiana Go

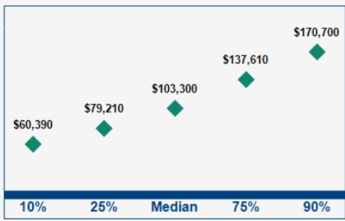
In Indiana:

Employment (2022)	270 employees
Projected employment (2032)	360 employees
Projected growth (2022-2032)	33%
Projected annual job openings (2022-2032)	30

In the United States:

Employment (2024)	32,200 employees
Projected employment (2034)	34,900 employees
Projected growth (2024-2034)	9% Much faster than average
Projected annual job openings (2024-2034)	2,000

Annual wages for Statisticians in United States



Sources: <https://www.bls.gov/ooh/math/operations-research-analysts.htm>
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Operations%20Research%20Analysts&onetcode=15-2031.00&location=indiana>

Management Analyst

Quick Facts: Management Analysts

2024 Median Pay ?	\$101,190 per year \$48.65 per hour
Typical Entry-Level Education ?	Bachelor's degree
Work Experience in a Related Occupation ?	Less than 5 years
On-the-job Training ?	None
Number of Jobs, 2024 ?	1,075,100
Job Outlook, 2024-34 ?	9% (Much faster than average)
Employment Change, 2024-34 ?	94,500

Projected employment

United States
1,075,100 2024 Employment
1,169,700 2034 Employment
9% Percent change
98,100 Annual projected job openings

Indiana Employment Trends

13-1111.00 - Management Analysts ⭐ Bright Outlook

View trends for state: Indiana Go

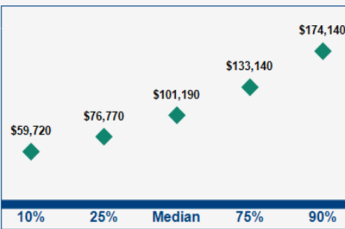
In Indiana:

Employment (2022)	13,510 employees
Projected employment (2032)	14,930 employees
Projected growth (2022-2032)	11%
Projected annual job openings (2022-2032)	1,290

In the United States:

Employment (2024)	1,075,100 employees
Projected employment (2034)	1,169,700 employees
Projected growth (2024-2034)	9% Much faster than average
Projected annual job openings (2024-2034)	98,100

Annual wages for Management Analysts in United States

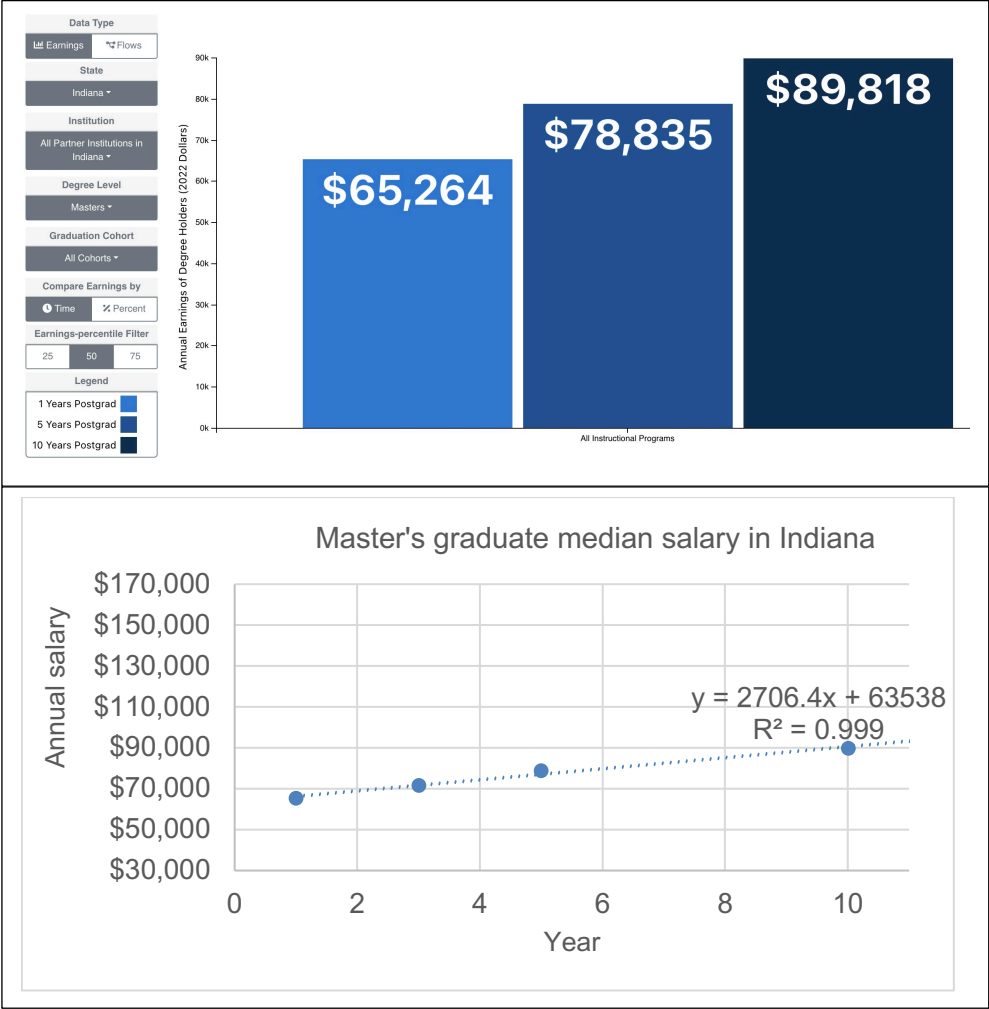


Sources: <https://www.bls.gov/ooh/math/operations-research-analysts.htm>
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Operations%20Research%20Analysts&onetcode=15-2031.00&location=indiana>

Appendix 3: Summary of wage data

Provide a summary of wage data for graduates from similar programs at peer institutions and/or wages by experience level for the relevant occupations identified under (3.e.), citing authoritative sources such as the U.S. Census Bureau’s Post-Secondary Employment Outcomes (PSEO) data, the PSEO Coalition’s ‘Living Wage vs. Postsecondary Graduate Earnings’ by certificate level, Indiana DWD and ‘Top Jobs’, the MIT ‘Living Wage Calculator’ for Indiana and region, U.S. Department of Education’s College Scorecard, the New York Federal Reserve’s labor market data for recent college graduates, Indiana DWD, U.S. BLS, Lightcast, other proprietary tools, etc. (This appendix should contain tables upon which the above estimates are based upon and/or relevant pages from the analyses.)

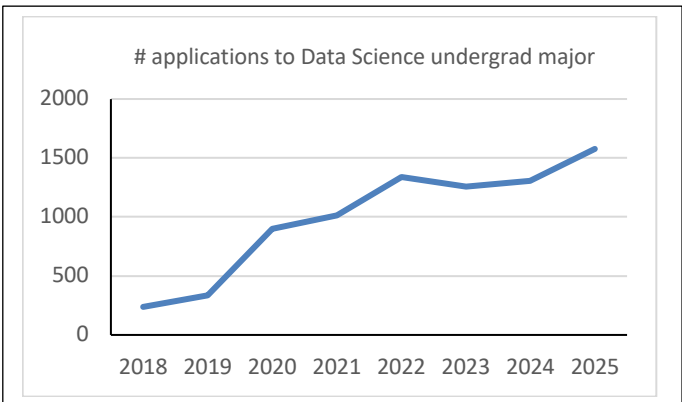
Graph utilizes data from U.S. Census Bureau’s [Post-Secondary Employment Outcomes \(PSEO\)](#), to calculate the linear rate of change for annual salaries of graduates of master's programs.



Appendix 4: Student interest/demand

In addition to the above narrative analysis, include authoritative data tables demonstrating student interest and demand, such as web traffic and search engine analytics and student surveys. Save the details for specific enrollment projections for (5.c.). (This appendix should contain graphs/tables, relevant pages from analyses, and/or links to cited sources.)

Evidence for interest in Data Science as a field of study comes from the growth in popularity in the undergraduate major in Data Science at Purdue. This major was established in 2018, and has shown a 565% increase in applications, from 237 applications in 2018 to 1577 applications in 2025.



Evidence of demand in the workplace comes from Lightcast Program Overview Reports run in October 2025, Q4 2025 Dataset, with a substantial number of jobs and annual job openings, both in Indiana and nationwide.

Field (CIP Code)	Nationwide			Indiana		
	Number of jobs in 2023	Annual openings	Median earnings	Number of jobs in 2023	Annual openings	Median earnings
Actuarial Science (CIP 52.1304)	199,928	25,510	\$145.6K/yr	2,921 16% below National average	524	\$119.0K/yr
Applied Statistics (CIP 27.06)	998,422	126,815	\$93.9K/yr	17,715 2% above national average	2026	\$80.9K/yr
Data Science, general (CIP 30.7001)	880,849	102,744	\$136.5K/yr	8,770 43% below National average	1,175	\$105.7K/yr
Data Science, other (CIP 30.7099)	720,727	85,860	\$92.1K/yr	No programs in IN with this CIP code		
Data Analytics (CIP 30.7101)	981,112	122,288	\$92.5K/yr	17,596 3% above National average	1835	\$80.5K/yr

Appendix 5: In addition to a narrative analysis above, include the most recent data for the applicable programs' completions, growth trends, and market share data, such as the most recent IPEDS or Lightcast data. (This appendix should contain graphs/tables, relevant pages from the analyses, and/or links to cited sources.)

Data from Lightcast Program Overview Reports run in October 2025, Q4 2025 Dataset

Field (CIP Code)	Completions in 2024	Growth in completions, 2020-2024
Actuarial Science (CIP 52.1304)	232	-47%
Applied Statistics (CIP 27.06)	369	184%
Data Science, general (CIP 30.7001)	4322	2,725%
Data Science, other (CIP 30.7099)	6	500%
Data Analytics (CIP 30.7101)	931	958%

Actuarial Science (CIP 52.1304)

Institution	Master's Degree Completions (2024)	Growth % YOY (2024)	Market Share (2024)	IPEDS Tuition & Fees (2023)	Completions Trend (2020-2024)
University of California-Los Angeles	89	14.1%	38.4%	\$13,747	
Georgia State University	30	-6.3%	12.9%	\$8,478	
Boston University	19	-32.1%	8.2%	\$65,168	
Columbia University in the City of New York	18	-60.0%	7.8%	\$68,171	
University of Illinois Urbana-Champaign	15	-6.3%	6.5%	\$18,060	
Arizona State University Campus Immersion	8	-27.3%	3.4%	\$12,051	
Ball State University	8	33.3%	3.4%	\$10,758	
University of Iowa	7	40.0%	3.0%	\$10,964	
University of California-Santa Barbara	6	-40.0%	2.6%	\$14,965	
Ohio State University-Main Campus	6	100.0%	2.6%	\$12,859	

Applied Statistics (CIP 27.06)

Institution	Master's Degree Completions (2024)	Growth % YOY (2024)	Market Share (2024)	IPEDS Tuition & Fees (2023)	Completions Trend (2020-2024)
University of Michigan-Ann Arbor	71	-23.7%	19.2%	\$18,309	
Johns Hopkins University	58	383.3%	15.7%	\$62,840	
Colorado State University-Fort Collins	32	68.4%	8.7%	\$13,009	
University of Kansas	28	0.0%	7.6%	\$11,700	
Arizona State University Digital Immersion	28	180.0%	7.6%	\$11,421	
Rochester Institute of Technology	22	29.4%	6.0%	\$56,664	
University of Delaware	18	38.5%	4.9%	\$16,080	
Michigan Technological University	17	-46.9%	4.6%	\$19,747	
Villanova University	15	-16.7%	4.1%	\$64,701	
Bowling Green State University-Main Campus	13	-13.3%	3.5%	\$13,390	

Data Science, general (CIP 30.7001)

Institution	Master's Degree Completions (2024)	Growth % YOY (2024)	Market Share (2024)	IPEDS Tuition & Fees (2023)	Completions Trend (2020-2024)
Eastern University	664	41.9%	15.4%	\$37,420	
University of North Texas	344	Insf. Data	8.0%	\$11,164	
Columbia University in the City of New York	203	-15.4%	4.7%	\$68,171	
New Jersey Institute of Technology	201	32.2%	4.7%	\$19,022	
The University of Texas at Austin	174	107.1%	4.0%	\$11,678	
San Jose State University	171	Insf. Data	4.0%	\$7,992	
New York University	167	Insf. Data	3.9%	\$60,438	
Saint Peter's University	154	250.0%	3.6%	\$41,054	
Lewis University	122	Insf. Data	2.8%	\$37,882	
University of Virginia-Main Campus	120	-23.6%	2.8%	\$22,323	

Data Analytics (CIP 30.7101)

Institution	Master's Degree Completions (2024)	Growth % YOY (2024)	Market Share (2024)	IPEDS Tuition & Fees (2023)	Completions Trend (2020-2024)
University of Chicago	246	-2.0%	26.4%	\$65,619	
Westcliff University	82	127.8%	8.8%	\$21,000	
Concordia University-Saint Paul	68	1,600.0%	7.3%	\$25,000	
University of Houston-Downtown	58	5.5%	6.2%	\$7,536	
Virginia Commonwealth University	47	4.4%	5.0%	\$16,233	
University of Mississippi	45	164.7%	4.8%	\$9,412	
University of Massachusetts-Dartmouth	40	81.8%	4.3%	\$15,208	
Franklin University	35	34.6%	3.8%	\$9,577	
The University of Texas at San Antonio	29	-59.2%	3.1%	\$9,279	
Tufts University	27	Insf. Data	2.9%	\$67,844	

Appendix 6: Exceeding the Standard Expectation of Credit Hours, Detail (This appendix, if necessary, should contain detailed information on why it is necessary to exceed the standard credit hour expectation, such as links to relevant licensure and/or accreditation standards.)

Not applicable.

Appendix 7: Degree Maps by Each of the Specified Student Populations, Detail (This appendix should contain the semester-by-semester, course-level detail on the program curriculum, including how long it will take to complete the program, assuming full-time or part-time study, as applicable.)

Plan of study for the Data Science major

One year plan – five courses/15 credits per semester

	Credits	Fall	Spring
Core program requirements	6	Foundations and Advances in Statistics - STAT 50900 Case Studies in Statistical Programming with R and Python – STAT 53500	
Data Science major required courses – take <u>at least four</u> of these five courses	12-15	Simulation for Data Science – STAT 53400 Applied Data Analytics – CIT 52600 Foundations of Deep Learning – CS 58700 Artificial Intelligence – ECE 57000	Reinforcement Learning <i>for Applications in Statistics and Data Science</i> - STAT 58300 Artificial Intelligence – ECE 57000
Data Science selectives - take <u>at least one</u> of these four courses	3-9	Design Of Experiments - STAT 51400 Sampling and Survey Techniques – STAT 52200	Time Series And Applications - STAT 52000 Applied Regression Analysis – STAT 51200
Other available program selectives The remainder of the 30 credits can be fulfilled with these courses		Quantitative Risk Management – STAT 55000	Intermediate Statistical Methodology (Linear Models) - STAT 52500 Causal Inference - STAT 55600 Applied Decision Theory And Bayesian Statistics - STAT 52900 Computational Finance I – STAT 54000 Machine Learning in Finance and Insurance – STAT 58700

*Modern Time Series, STAT 52000, and Modern Experimental Design, STAT 51400 also available online and in summer

This one-year plan can easily be adapted to a 2+ year plan for parttime students, focusing first on the core courses and a couple of electives in the first two semesters, and then continuing with electives in the subsequent semesters.

Multi-year plan, with optional add-on of certificate in Foundations of Sport Management

Courses notes above for the Data Science major for the MS in Multidisciplinary Quantitative Sciences plus the following Foundations of Sport Management certificate courses, *choosing at least three of the following core certificate courses, plus two additional Sport Management electives, for five courses / 15 credits total.*

- Sport Analytics - HK 51800
- Sport Administration - HK 52100
- Sport Law and Ethics - HK 52200
- The Business of Sport - HK 56300
- Marketing, Revenue Generation, and Sales in Sport - HK 57700

- Organizational Behavior/Leadership in Sport - HK 57800

Plan of study for the Applied Statistics major

One year plan – five courses/15 credits per semester

	Credits	Fall	Spring
Core program requirements	6	Foundations and Advances in Statistics - STAT 50900 Case Studies in Statistical Programming with R and Python – STAT 53500	
Applied Statistics major required courses – take <u>at least four</u> of these six courses	12-18	Design of Experiments - STAT 51400 Sampling and Survey Techniques – STAT 52200	Time Series and Applications - STAT 52000 Intermediate Statistical Methodology (Linear Models) - STAT 52500 Causal Inference - STAT 55600 Applied Decision Theory And Bayesian Statistics - STAT 52900
Applied Statistics selectives – take <u>at least one</u> of these four courses	3-9	Foundations of Deep Learning – CS 58700 Artificial Intelligence – ECE 57000	Applied Regression Analysis – STAT 51200 Artificial Intelligence – ECE 57000 Reinforcement Learning for Applications in Statistics and Data Science - STAT 58300
Other available program selectives The remainder of the 30 credits can be fulfilled with these courses		Quantitative Risk Management – STAT 55000 Applied Data Analytics - CIT 52600	STAT 53400 - Simulation for Data Science Computational Finance I – STAT 54000 Machine Learning in Finance and Insurance – STAT 58700

*Modern Time Series, STAT 52000, and Modern Experimental Design, STAT51400 also available online and in summer

This one-year plan can easily be adapted to a 2+ year plan for parttime students, focusing first on the core courses and a couple of electives in the first two semesters, and then continuing with electives in the subsequent semesters.

Plan of study for the Quantitative Finance, Insurance, and Risk Management major

One year plan – five courses/15 credits per semester

	Credits	Fall	Spring
Core program requirements	6	Foundations and Advances in Statistics - STAT 50900 Case Studies in Statistical Programming with R and Python – STAT 53500	
QFIRM major required courses – take these <u>four</u> courses	12	Quantitative Risk Management – STAT 55000	Applied Regression Analysis – STAT 51200 Computational Finance I – STAT 54000

			<i>Machine Learning in Finance and Insurance – STAT 58700</i>
QFIRM major selectives – take <u>at least three</u> of these four courses	9-15	<i>Simulation for Data Science – STAT 53400</i> <i>Foundations of Deep Learning – CS 58700</i> <i>Artificial Intelligence – ECE 57000</i>	<i>Artificial Intelligence – ECE 57000</i> <i>Reinforcement Learning for Applications in Statistics and Data Science - STAT 58300</i>
Other available program selectives <i>The remainder of the 30 credits can be fulfilled with these courses</i>		<i>Design of Experiments - STAT 51400</i> <i>Sampling and Survey Techniques – STAT 52200</i> <i>Applied Data Analytics – CIT 52600</i>	<i>Time Series and Applications - STAT 52000</i> <i>Intermediate Statistical Methodology (Linear Models) - STAT 52500</i> <i>Causal Inference - STAT 55600</i> <i>Applied Decision Theory And Bayesian Statistics - STAT 52900</i>

**Modern Time Series, STAT 52000, is also available in summer online*

This one-year plan can easily be adapted to a 2+ year plan for parttime students, focusing first on the core courses and a couple of electives in the first two semesters, and then continuing with electives in the subsequent semesters.

Appendix 8: Articulation of Associate/Baccalaureate Programs, Detail (This appendix should contain the actual articulation agreements relevant to the proposed program. Prior to submitting the program proposal to the Commission, universities should work directly with Ivy Tech Community College and Vincennes University to develop articulation agreements that maximize transfer opportunities for students.)

Not applicable.

Appendix 9: Operating Cost Budgeting Estimates (This appendix should contain budgeting estimates and the per student cost. Comparisons to similar degree programs at other state educational institutions should draw from the Commission's 'Data Accountability and Transparency Dashboard' under IC 21-14-15-1.)

Year of program	1	2	3	4	5	6	7	8	
Estimated total expenditures	\$357,750	\$430,385	\$532,900	\$551,480	\$636,827	\$655,932	\$675,610	\$695,878	
<i>Instructional staff</i>	<i>\$233,000</i>	<i>\$289,990</i>	<i>\$298,690</i>	<i>\$307,650</i>	<i>\$316,880</i>	<i>\$326,386</i>	<i>\$336,178</i>	<i>\$346,263</i>	
<i>Support staff</i>	<i>\$48,000</i>	<i>\$49,440</i>	<i>\$119,923</i>	<i>\$125,591</i>	<i>\$182,358</i>	<i>\$187,829</i>	<i>\$193,464</i>	<i>\$199,268</i>	
<i>Recruiting and marketing</i>	<i>\$15,000</i>	<i>\$15,450</i>	<i>\$15,914</i>	<i>\$16,391</i>	<i>\$16,883</i>	<i>\$17,389</i>	<i>\$17,911</i>	<i>\$18,448</i>	
<i>Other S&E</i>	<i>\$3,250</i>	<i>\$3,250</i>	<i>\$3,250</i>	<i>\$3,250</i>	<i>\$3,250</i>	<i>\$3,250</i>	<i>\$3,250</i>	<i>\$3,250</i>	
Student FTE	19	21	25	29	29	36	36	36	
Cost per FTE student	\$18,829	\$20,495	\$21,316	\$19,017	\$21,960	\$18,220	\$18,767	\$19,330	Average \$19,741

Data from [Data Accountability and Transparency Dashboard](#) on other state institutions with similar degree programs (data from 2024):

Institution	Degree program (CIP code as provided by institution)	Cost per student or Median Net Tuition for Indiana resident students
Ball State University	Master's, Business, Management, Marketing, and Related Support Services (52)	\$19,023
Indiana University System	Bachelor's in Actuarial Science (52.1304)	\$10,501 to \$16,384, depending on campus

Available tuition information on other Indiana institutions that were noted in Section 5b (*Market Inventory*, identified by "[TransferIN Indiana](#)" [Academic Program Inventory](#) with relevant CIP codes):

[Saint Mary's College](#) – \$53,934 tuition

[Butler University](#) – \$25,500 (based on \$850/credit and 30 credits)

[Ball State University](#) – \$13,920 Indiana resident (based on 30 credits at \$464/credit), \$38,070 non- resident (based on 30 credits at \$1269/credit)

[Indiana University](#) - \$11,090 Indiana resident, \$30,792 non-residents for tuition and mandatory fees

Appendix 10: Faculty and Staff, Detail (This appendix should contain a list of faculty with appointments to teach in the program and a brief description of new faculty positions yet to be filled.)

Xiao Wang, PhD; Professor and Department Head, Department of Statistics

Jianxi Su, Associate Professor, Director of Actuarial Science, Department of Statistics

Raghu Pasupathy, Professor, Department of Statistics

Kiseop Lee, PhD, Associate Professor, Department of Statistics

Atinuke Adebajji. Associate Professor of Practice, Department of Statistics

Ernest Aboagye, Senior Lecturer, Department of Mathematics and Department of Statistics

Shimeng Huang, Assistant Professor, Department of Statistics and Department of Mathematics

New faculty position yet to be filled - https://careers.purdue.edu/job/Professor-ClinicalProfessional-Assistant/39300-en_US

Job Summary

The College of Science at Purdue University invites applications for appointment as Professor of Practice (PoP) to join the MS in Multidisciplinary Quantitative Sciences program at the Indianapolis campus. The appointment is to begin in Fall 2026 and may be at the level of Assistant or Associate Professor of Practice. The PoP position is a non-tenure track faculty position with multi-year contracts, a promotion track, and a focus on teaching and program development. Duties will typically consist of teaching 5-6 courses in Indianapolis each academic year, including curriculum design, and other developmental activities. Successful applicants will have a documented record of effective teaching, the ability to teach a range of courses in Data Science, and a commitment to curriculum design and development. Candidates should specifically note in their application any experience in Data Science, curriculum design, and other unique teaching qualifications. Candidates must have a PhD (or its equivalent) in statistics or a closely related field by the start of the appointment.

Appendix 11: Capital Costs, Detail. (If necessary, this appendix should contain additional information on capital costs to successfully launch and deliver the proposed program.)

Not applicable.

Appendix 12: Letters of Support

- 1) Toby Hall, Executive Vice President and Chief Information Officer, Delta Dental of Michigan, Ohio, and Indiana
- 2) Yongming Qu, Vice President in Statistics, Data and Analysis, Eli Lilly and Company
- 3) Everette Mills, Vice President of Product Management, GrayHair Software, LLC
- 4) Haoda Fu, Head of Exploratory Biostatistics, Amgen, and Adjunct Full Professor of Biostatistics and Health Data Sciences, Indiana University School of Medicine
- 5) Yuanyuan Li, Senior Research Scientist, Munich Re
- 6) Carla Gilson, Senior Associate Athletics Director, Sports Performance and Wellness, Purdue University Athletics
- 7) Jeanne Boyd, Executive Director, Sport Management, Purdue University, Department of Health and Kinesiology
- 8) Wooing Sun Lee, CEO, SK Hynix Semiconductor West Lafayette LLC
- 9) Kevin O'Connor, Leadership Development Associate, Fire Modeling Development and Research, State Farm
- 10) Chris Kuo, Director of Data Science & Analysis, The Hartford Insurance



Proposed Master of Science in Multidisciplinary Quantitative Sciences

Letters of Support

1. Toby Hall, Executive Vice President and Chief Information Officer, Delta Dental of Michigan, Ohio, and Indiana
2. Yongming Qu, Vice President in Statistics, Data and Analysis, Eli Lilly and Company
3. Everette Mills, Vice President of Product Management, GrayHair Software, LLC
4. Haoda Fu, Head of Exploratory Biostatistics, Amgen, and Adjunct Full Professor of Biostatistics and Health Data Sciences, Indiana University School of Medicine
5. Yuanyuan Li, Senior Research Scientist, Munich Re
6. Carla Gilson, Senior Associate Athletics Director, Sports Performance and Wellness, Purdue University Athletics
7. Jeanne Boyd, Executive Director, Sport Management, Purdue University, Department of Health and Kinesiology
8. Wooing Sun Lee, CEO, SK Hynix Semiconductor West Lafayette LLC
9. Kevin O'Connor, Leadership Development Associate, Fire Modeling Development and Research, State Farm
10. Chris Kuo, Director of Data Science & Analysis, The Hartford Insurance

October 2, 2025

Dear Members of the Purdue Board of Trustees and the Indiana Commission for Higher Education:

I am writing to express our strong support for Purdue University's proposed Master's program in Multidisciplinary Quantitative Science, with a major in Quantitative Finance, Insurance, and Risk Management (QFIRM).

Quantitative finance, insurance, and risk management play a critical role in helping organizations and governments navigate uncertainty, evaluate risk, and make sound financial decisions. As sectors such as insurance, pensions, healthcare, and financial services become increasingly complex, the demand for professionals with advanced quantitative, computational, and analytical skills continues to grow. The proposed program will serve as a vital pipeline for training future leaders who can leverage cutting-edge data science and AI methods to address real-world financial and risk management challenges.

We are especially encouraged by the program's emphasis on integrating data science, machine learning, and AI into an expanded toolkit for addressing challenges in financial and insurance risk management. This blend of rigorous theory with practical application reflects the evolving skill set required in today's actuarial and risk management professions, where practitioners must be equally adept at technical analysis and effective communication with decision-makers.

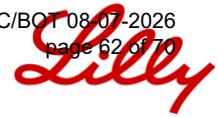
At Delta Dental of Michigan, Ohio, and Indiana, we see clear opportunities to engage with the program—whether by offering internships and experiential learning opportunities, collaborating on applied projects, providing guest lectures, or serving in an advisory capacity. Such collaboration will strengthen the connection between academic preparation and professional practice, ensuring graduates are ready to excel in their careers.

We have long appreciated Purdue University for its leadership in actuarial science and its distinction as a Center of Actuarial Excellence recognized by the Society of Actuaries. This forward-looking master's program will build on Purdue's outstanding bachelor's program, reaffirming the central importance of actuarial science within the broader landscape of financial and risk management. We strongly endorse its approval and look forward to the contributions its graduates will make to both industry and society.

Most sincerely,



Toby Hall, FSA, MAAA, FCA
Executive Vice President and Chief Information Officer
Delta Dental of Michigan, Ohio, and Indiana



Lilly Corporate Center
Indianapolis, IN 46285
Email: qu_yongming@lilly.com
Phone: (317)850-4348

October 10, 2025

Dear Members of the Purdue Board of Trustees and the Indiana Commission for Higher Education,

I am writing to express our strong support for Purdue University's proposed Master's program in Multidisciplinary Quantitative Science, with a major in Applied Statistics.

The ability to design, analyze, and interpret data from clinical trials is central to the advancement of modern medicine and public health. From discovery and evaluating the safety and efficacy of new therapies, applied statistics is at the core of clinical research. As the volume and complexity of trial data continue to increase—driven by advances in genomics, adaptive designs, and real-world evidence—there is a pressing need for professionals trained in rigorous statistical methodology who can translate data into reliable conclusions.

We are encouraged that the proposed program emphasizes both the theoretical foundations of statistical inference and their practical applications to real-world problems. Training in areas such as survival analysis, longitudinal data methods, experimental design, and regulatory biostatistics will prepare graduates to contribute meaningfully to the pharmaceutical, biotechnology, and healthcare sectors. Just as importantly, training in effective communication of statistical findings will equip students to serve as trusted collaborators in interdisciplinary research teams.

At Eli Lilly and Company, we see valuable opportunities to collaborate with this program through internships, applied project partnerships, and potential guest lectures by our biostatistical staff. We believe such interactions will enrich student learning while also building connections between academia and industry that support innovation in clinical development.

We commend Purdue University for recognizing the essential role applied statistics plays in advancing medical research and improving patient outcomes. We strongly support the establishment of this program and are confident that its graduates will be well-prepared to address the challenges of modern clinical research.

Sincerely,

A handwritten signature in black ink, appearing to read "Yongming Qu".

Yongming Qu, PhD
Vice President in Statistics, Data and Analytics



Purdue Board of Trustees and the Indiana Commission for Higher Education:

As a Purdue University alumnus and a data science industry professional with nearly 20 years of experience, I write to express my personal support for Purdue University's proposed master's degree program in Multidisciplinary Quantitative Science, with a major in Data Science.

Throughout my career, I have worked extensively in data processing, analytics, machine learning, and AI applications. In my current role as Vice President of Product Management at GrayHair Software, I partner with teams that work with over 100 billion + data points annually.

This experience has shown me that the true challenge in our field is not simply collecting or storing data—it is finding professionals who can synthesize vast amounts of information and transform it into actionable intelligence. The ability to bridge the gap between raw data and meaningful business decisions is increasingly rare and critically important.

This skills gap is not unique to any single company or sector. Across industries—from finance and healthcare to manufacturing and logistics—organizations are struggling to find talent capable of turning data into competitive advantage. Addressing this need is essential not only for individual businesses but for our country's economic competitiveness on the global stage.

I have been afforded the opportunity to collaborate with Purdue University on a competitively selected project focused on data quality and machine learning/artificial intelligence, including work coordinated with the College of Science. The program's core emphasis on interdisciplinary training and applied projects precisely mirrors the competencies sought by contemporary employers: professionals adept not only at data analysis but also at insight communication and the execution of tangible, real-world outcomes.

I would welcome potential opportunities to support the program through guest lectures, mentorship, or advisory service, and I encourage other industry professionals to do the same. These types of partnerships strengthen the connection between academic preparation and industry application.

I commend the Purdue College of Science for developing this forward-looking program, which will be an asset both to students and to the broader data science community. Graduates of this program will be well-prepared to contribute immediately and meaningfully to data-driven innovation in the workplace. I wholeheartedly endorse the approval of this program.

Sincerely,

Everette Mills
Purdue University, BS 1999-2003
Vice President of Product Management, GrayHair Software



INDIANA UNIVERSITY
SCHOOL OF MEDICINE

Indiana University School of Medicine

340 West 10th Street

Fairbanks Hall, Suite 6200

Indianapolis, IN 46202-3082

Dear Members of the Purdue Board of Trustees and the Indiana Commission for Higher Education:

I am writing to express our strong support for Purdue University's proposed Master's program in Multidisciplinary Quantitative Science, with a major in Data Science.

Data Science plays a critical role in helping organizations and governments navigate uncertainty, evaluate risk, and make sound decisions. As sectors such as healthcare, and pharmaceutical research become increasingly complex, the demand for professionals with advanced quantitative, computational, and analytical skills continues to grow. The proposed program will serve as a vital pipeline for training future leaders who can leverage cutting-edge data science and AI methods to address real-world healthcare and pharmaceutical research.

We are especially encouraged by the program's emphasis on integrating data science, machine learning, and AI into an expanded toolkit for addressing challenges in healthcare and pharmaceutical research. This blend of rigorous theory with practical application reflects the evolving skill set required in today's healthcare research challenges, where practitioners must be equally adept at technical analysis and effective communication with decision-makers.

At Amgen, and Indiana University School of Medicine, we see clear opportunities to engage with the program—whether by offering internships and experiential learning opportunities, collaborating on applied projects, providing guest lectures, or serving in an advisory capacity. Such collaboration will strengthen the connection between academic preparation and professional practice, ensuring graduates are ready to excel in their careers.

We have long appreciated Purdue University for its leadership in the field of Statistics and Data Science. This forward-looking master's program will build on Purdue's outstanding bachelor's program, reaffirming the central importance of data science within the broader landscape of healthcare and data science in pharmaceutical research. We strongly endorse its approval and look forward to the contributions its graduates will make to both industry and society.

Cordially,

A handwritten signature in black ink, appearing to read "Haoda Fu".

Haoda Fu, PhD
Adjunct Full Professor of Biostatistics and Health Data Science
Indiana University School of Medicine
Head of Exploratory of Biostatistics, Amgen



Dear Members of the Purdue Board of Trustees and the Indiana Commission for Higher Education:

I am writing to express our strong support for Purdue University's proposed Master's program in Multidisciplinary Quantitative Science, with a major in Quantitative Finance, Insurance, and Risk Management (QFIRM) and a Major in Data Science.

Quantitative finance, insurance, and risk management play a critical role in helping organizations and governments navigate uncertainty, evaluate risk, and make sound financial decisions. As sectors such as insurance, pensions, healthcare, and financial services become increasingly complex, the demand for professionals with advanced quantitative, computational, and analytical skills continues to grow. The proposed program will serve as a vital pipeline for training future leaders who can leverage cutting-edge data science and AI methods to address real-world financial and risk management challenges.

We are especially encouraged by the program's emphasis on integrating data science, machine learning, and AI into an expanded toolkit for addressing challenges in financial and insurance risk management. This blend of rigorous theory with practical application reflects the evolving skill set required in today's actuarial and risk management professions, where practitioners must be equally adept at technical analysis and effective communication with decision-makers.

At Munich Re, we see clear opportunities to engage with the program—whether by offering internships and experiential learning opportunities, collaborating on applied projects, providing guest lectures, or serving in an advisory capacity. Such collaboration will strengthen the connection between academic preparation and professional practice, ensuring graduates are ready to excel in their careers.

We have long appreciated Purdue University for its leadership in actuarial science and its distinction as a Center of Actuarial Excellence recognized by the Society of Actuaries. This forward-looking master's program will build on Purdue's outstanding bachelor's program, reaffirming the central importance of actuarial science within the broader landscape of financial and risk management. We strongly endorse its approval and look forward to the contributions its graduates will make to both industry and society.

Most sincerely,

A handwritten signature in black ink, appearing to read "Yuanyuan Li". The signature is fluid and cursive, with the first name "Yuanyuan" and the last name "Li" clearly distinguishable.

Yuanyuan Li

Senior Research Scientist

Munich Re

December 9, 2025

Dear Members of the Purdue Board of Trustees and the Indiana Commission for Higher Education:

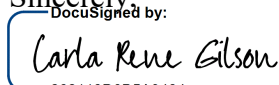
I am pleased to offer my strong support for Purdue University's proposed Master of Science degree program in Multidisciplinary Quantitative Science, with a major in Data Science.

The demand for professionals in the sports industry who possess advanced data analytics skills is growing rapidly—both in Indiana and nationwide. This new master's program directly aligns with that need. In particular, its partnership with Purdue's new MS in Sport Management provides a powerful interdisciplinary collaboration, emphasizing cross-unit collaboration, quantitative literacy, and hands-on applied learning.

Within Purdue Athletics, our Strength and Conditioning unit has already begun building meaningful connections with faculty and leadership from both degree programs. Earlier this fall, we launched a data analytics pilot project involving a faculty member in Statistics and a student in the MS in Sport Management program. Even at this early stage, it is clear that this proof-of-principle project is scalable and can evolve into a robust pipeline of independent student projects, applied case studies, and real-world learning opportunities that directly benefit both academic programs and Athletics.

Additionally, Purdue Athletics is aspiring to create a sport science program that would rely heavily on talents in data science and statistical analytics. Graduates with training from these two master's programs at Purdue—Sport Management and Multidisciplinary Quantitative Science—represent exactly the type of talent we aim to recruit and hire to develop, expand, and elevate this program, to propel Purdue Athletics to the pinnacle of college sports.

We congratulate the Purdue College of Science for its leadership in developing this forward-looking program, and we strongly endorse its approval. We see tremendous benefit not only for future students in this program, but also for students in the MS in Sport Management program, for Purdue Athletics and our student-athletes, and for the broader sport management and analytics communities.

Sincerely,
DocuSigned by:

262113D0B5A9484...
Carla Gilson

Senior Associate Athletics Director, Sports Performance and Wellness
Purdue University Athletics





Department of Health
and Kinesiology

December 16, 2025

Dear Purdue Board of Trustees and the Indiana Commission for Higher Education,

We are pleased to offer our full support for the proposed Master of Science degree in Multidisciplinary Quantitative Science (MQS), with a major in Data Science, being developed by the Purdue College of Science.

Analytics has long-informed decision-making in the sport industry, as it has across other business sectors. What has changed is the extent to which sport organizations now rely on data as a core driver of strategy. Analytics directly informs decisions related to roster construction, athlete performance and health, competitive strategy, ticket pricing, sponsorship valuation, fan engagement, and more. While students in the Master of Science in Sport Management (MSSM) develop an applied understanding of analytics within a sport management context, the MQS program provides the depth of quantitative training required to meet the industry's growing demand for advanced analytical expertise.

The shared presence of both programs in Indianapolis further strengthens this opportunity. Indianapolis is home to a wide range of sport organizations, governing bodies, and major events, many of which are expanding their use of analytics but lack the internal expertise to fully leverage it. Locating both programs in Indianapolis gives students and faculty direct access to these organizations and creates immediate opportunities for applied collaboration.

We are already seeing the value of this partnership. This fall, we worked with the College of Science and Purdue Athletics to launch a pilot project involving Purdue Strength and Conditioning. The project is off to a strong start and reflects the type of applied, high-impact learning experiences these programs are positioned to support. Together, the MSSM and MQS will prepare graduates to meet the growing demand for data-informed leadership across Indiana's sport sector and beyond.

We believe this degree will serve Purdue students, our industry partners, and the state of Indiana well, and unequivocally support its approval.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeanne M. Boyd'.

Jeanne M. Boyd, Ph.D.
Executive Director, Sport Management

SK Hynix Semiconductor West Lafayette LLC

West Lafayette, IN 47906

Email : woodingsun.lee@sk.com

Phone: (317) 995-4172

December 23, 2025

Dear Members of the Board of Trustees and the Indiana Commission for Higher Education,

I am writing to express our strong support for Purdue University's proposed Master's program in Multidisciplinary Quantitative Science, with a major in Applied Statistics.

Purdue University has long been recognized as a leader in Statistics and Data Science education. This forward-looking program builds upon Purdue's outstanding expertise and reputation in quantitative disciplines, reaffirming the central role of applied statistics and data science in advancing innovation and operational excellence.

In today's advanced semiconductor manufacturing and technology sectors, the ability to collect, analyze, and interpret complex data is critical for driving innovation, managing risk, and maintaining global competitiveness. The increasing complexity of semiconductor manufacturing processes—combined with the use of AI, machine learning, and advanced statistical modeling—demands professionals who possess deep theoretical expertise as well as the capacity to apply these skills to real-world industrial challenges.

We are especially encouraged by the program's emphasis on integrating rigorous statistical theory with modern data science tools, including predictive modeling, reliability engineering, multivariate analysis, and AI-driven process optimization. This blend of foundational knowledge and cutting-edge techniques reflects the evolving skill set required in high-tech industries, where practitioners must be equally adept at technical analysis and effective communication with cross-disciplinary teams.

At SK hynix Semiconductor West Lafayette LLC, we appreciate Purdue University's continued leadership in advancing quantitative science and applied statistics. We value opportunities for academic-industry dialogue and will follow with interest developments in this field, as they reinforce the vital connection between academic research and industrial practice.

We strongly endorse approval of this program and look forward to the positive impact its graduates will have on industry and society.

Sincerely,



WOONG SUN LEE, P.E.

CEO, SK Hynix Semiconductor West Lafayette LLC



State Farm
Corporate Headquarters
1 State Farm Plaza
Bloomington, IL 61710-0001

December 17, 2025

Jianxi Su, Ph.D., FSA
Associate Professor of Statistics
Director of Actuarial Science
Department of Statistics, Purdue University,
150 North University Street
West Lafayette, IN 47907-2067

Dear Members of the Purdue Board of Trustees and the Indiana Commission for Higher Education,

I am writing to express our strong support for Purdue University's proposed Master's program in Multidisciplinary Quantitative Science, with a major in Quantitative Finance, Insurance, and Risk Management (QFIRM).

Quantitative finance, insurance, and risk management play a critical role in helping organizations and governments navigate uncertainty, evaluate risk, and make sound financial decisions. As sectors such as insurance, pensions, healthcare, and financial services become increasingly complex, the demand for professionals with advanced quantitative, computational, and analytical skills continues to grow. The proposed program will serve as a vital pipeline for training future leaders who can leverage cutting-edge data science and AI methods to address real-world financial and risk management challenges.

We are especially encouraged by the program's emphasis on integrating data science, machine learning, and AI into an expanded toolkit for addressing challenges in financial and insurance risk management. This blend of rigorous theory with practical application reflects the evolving skill set required in today's actuarial and risk management professions, where practitioners must be equally adept at technical analysis and effective communication with decision-makers.

We have long appreciated Purdue University for its leadership in actuarial science and its distinction as a Center of Actuarial Excellence recognized by the Society of Actuaries. This forward-looking master's program will build on Purdue's outstanding bachelor's program, reaffirming the central importance of actuarial science within the broader landscape of financial and risk management. We strongly endorse its approval and look forward to the contributions its graduates will make to both industry and society.

Sincerely,

Kevin O'Connor
Leadership Development Associate
Fire Modeling Development and Research
Email: Sherry.parker.cqt2@statefarm.com



Dear Members of the Purdue Board of Trustees and the Indiana Commission for Higher Education:

I am writing to express our strong support for Purdue University's proposed Master's program in Multidisciplinary Quantitative Science, with a major in Quantitative Finance, Insurance, and Risk Management (QFIRM).

Quantitative finance, insurance, and risk management play a critical role in helping organizations and governments navigate uncertainty, evaluate risk, and make sound financial decisions. As sectors such as insurance, pensions, healthcare, and financial services become increasingly complex, the demand for professionals with advanced quantitative, computational, and analytical skills continues to grow. The proposed program will serve as a vital pipeline for training future leaders who can leverage cutting-edge data science and AI methods to address real-world financial and risk management challenges.

We are especially encouraged by the program's emphasis on integrating data science, machine learning, and AI into an expanded toolkit for addressing challenges in financial and insurance risk management. This blend of rigorous theory with practical application reflects the evolving skill set required in today's actuarial and risk management professions, where practitioners must be equally adept at technical analysis and effective communication with decision-makers.

At Hartford Insurance, we see clear opportunities to engage with the program—whether by offering internships and experiential learning opportunities, collaborating on applied projects, providing guest lectures, or serving in an advisory capacity. Such collaboration will strengthen the connection between academic preparation and professional practice, ensuring graduates are ready to excel in their careers.

We have long appreciated Purdue University for its leadership in actuarial science and its distinction as a Center of Actuarial Excellence recognized by the Society of Actuaries. This forward-looking master's program will build on Purdue's outstanding bachelor's program, reaffirming the central importance of actuarial science within the broader landscape of financial and risk management. We strongly endorse its approval and look forward to the contributions its graduates will make to both industry and society.

Most sincerely,

Chris Kuo, Ph.D.

Director of Data Science & Analytics

The Hartford Insurance