UNIVERSITY BOARD OF TRUSTEES
EXECUTIVE SUMMARY DEGREE PROPOSAL TEMPLATE

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

DATE: December 10, 2021
TO: Board of Trustees
FROM: **Joseph M. Anderson, Primary Contact, (765) 494-4777; janderson@purdue.edu**
CC: Bryan DeWitt, Secondary Contact, bdewitt@purdue.edu
SUBJECT: **M.S. Graduate Studies, Applied Geospatial Analytics, Concentration changing to Major**

CAMPUS OFFERING DEGREE: **Purdue - West Lafayette**

ANTICIPATED START DATE: **August 2022**

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

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

Online. The 3 graduate certificates that stack to form this degree are already offered by Purdue – West Lafayette, and all faculty members are on the West Lafayette campus.

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

Big data, artificial intelligence, digital sensors, data analytics, and other technological innovations are increasingly transforming the world of agriculture to create the field of Digital Agricultural. This emergent sector is projected to represent a total market value of $240B across all sectors of agriculture by the year 2050. The rapid growth of opportunities in digital agriculture and the interdisciplinary nature of this sector has underscored the need for educational programs that meet the demand for emerging and existing professionals in data science and digital agriculture. The interdisciplinary nature of digital agriculture will necessitate that current industry professionals gain the knowledge and skills needed to support the growth of digital agriculture while demonstrating proficiency in communication to effectively communicate decisions based on the data analytics and manage people and programs for success. This is the first MS Interdisciplinary Studies graduate degree at Purdue University utilizing stackable credentials, a trailblazing trend in higher education supported by market research from Kaplan, Eduventures, and TEConomy (commissioned by Agrinovus).

This proposal is an interdisciplinary graduate major that combines strengths in Strategic Communication Management (Brian Lamb School of Communication), Applied Data Analytics (Purdue Polytechnic), and Spatial Data Science (College of Agriculture) to meet the needs of an emerging audience of professionals in all areas of agriculture, civil engineering, natural resource sciences, and land use management. This program aligns with the University's strategic Transformative Education 2.0 Initiative by implementing "flexible cross-disciplinary degree and credential options." The intended demographic is place-bound working professionals who would find it difficult - if not impossible - to give up their present positions to undertake an on-campus program. It is envisioned that, in addition to agricultural professionals, the program would also appeal to professionals in allied sectors including natural resource sciences, land use planning and management, civil engineering, construction planning, and related sectors including state and federal government agencies.

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

Agrinovus, after performing an extensive Talent Study with TEConomy, recommended the skills in these graduate certificates for prospective and current employees in the Agbiosciences field.

TEConomy surveyed 97 Indiana Agbioscience companies by email, with 23 responding (employing almost 9,000 people). When asked which skills are "critical 'emerging' areas of importance" for their workforce, here are some of their quotes which are related to this degree (p. 35-36):

- Spatial Data Science:
  - "Technology orientation, including embracing new technologies"
  - "Precision agriculture trends (moving fast, need to keep up)" (14 out of the 23 companies mentioned this)
- Applied Data Science Analytics:
  - "Use of data analytics to make informed decisions; managing 'Big Data'"
- Strategic Communication:
  - "Effective communication skills - both internally and externally"
  - "Customer service as a top priority"
  - "Media skills/public speaking skills"
  - "Public opinion influencers"
  - "Savvy with digital and social media; implementing new media technologies to interact with customers"

The projected growth in the AG Bioscience is robust and a number of these fields will be heavily involved in data science, using large and complex data sets, and many times in a geospatial context. Employment Growth Projects in Core Agbioscience Occupations 2012-22, from TEConomy's Agrinovus report (p. 24):

Occupational Group	Projected Empl. Growth, 2012–22
All Occupations	**12%**
Agbio Scientists & Agricultural Engineers	6%
Agbioscience Technicians	10%
Agricultural Support	7%
Food Production & Processing Workers	7%
Veterinarians & Vet Techs	**20%**

Source: TEConomy's analysis of Occupational Employment Projections, Indiana DWD.

For more information: https://agrinovusindiana.com/wp-content/uploads/2020/09/AgriNovus-Talent-Study-Final-Report-1.pdf

4. COSTS

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

$750 – in-state
$775 – out-of-state

B. Financial Projection Table

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

Enrollment projections were based on market research conducted by Agrinovus, Eduventures, and Kaplan, as well as internal data. It is challenging to accurately forecast projected enrollments for an interdisciplinary program. A conservative approach was taken to modeling this program, given the lack of identical competitors in the market. The financial outlook for this program is positive using these conservative enrollment projections and the estimated marketing costs for launching a new interdisciplinary degree.

C. Program Review and Expenditure Summary

https://www.purdue.edu/provost/policies/iche.html (Table 2)

The unique nature of this program means that Purdue Online will have to educate the market to teach prospective learners why they need this program. The marketing estimates listed are purposefully high

to provide this education until the market can be tested. Other online graduate programs typically have a marketing budget of approximately $3,000 per enrolled student for established programs. The long-term goal, once this program is established, is to bring the marketing financial plan closer to this value. However, experience has shown that online programs that did not spend enough time or budget marketing new programs fail early. Consequently, the projected expenses reflect this experience as we are fully determined to launch a very successful Applied Geospatial Analytics degree. Marketing and student support expenses will be reported to all stakeholders on a monthly basis and adjustments will be made to both the types and extent of marketing, as needed.

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

Internal data and market research from Agrinovus, Eduventures, and Kaplan were used to create the enrollment projections. However, we opted to use very conservative estimates due to the unique interdisciplinary nature of the program. There is reason to expect that true enrollment will be higher than these projections. For example, the Spatial Data Science graduate certificate had over 1000 leads for students potentially interested in the program, and the top reason students gave for not enrolling in the program was the lack of a master's degree attached to the certificate, which precluded these students from applying for financial aid. Students currently enrolled in each of the three certificates are also be a natural audience for this master's degree.

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

The only similar programs are the graduate certificates that lead to this interdisciplinary MS program.
- Graduate Certificate in Applied Data Analytics
- Graduate Certificate in Spatial Data Science
- Graduate Certificate in Strategic Communications

Purdue West Lafayette's Earth and Atmospheric Sciences Department offers a Professional Master's in Geodata Science for Purdue West Lafayette residential students with a STEM background (https://www.eaps.purdue.edu/gdsp/index.html). The EAPS program offers some courses in online or hybrid format but has much more of a technical emphasis, an emphasis on climatic data and no communication courses.

6. COMPETITIVE DEGREES – BRIEF SUMMARY

There are no competitive degrees. There are other programs that teach GIS and geospatial data, but this program is the first of its kind to combine three interdisciplinary graduate certificates in Applied Data Analytics, Spatial Data Science, and Strategic Communications. Market research suggests this program will address unmet needs expressed by employers within the agricultural sciences field. This degree is highly applicable and accessible to students from many fields beyond agriculture. It is precisely because of the interdisciplinary nature of this degree and the reach to this plethora of fields that the potential for this degree is quite high.

Recommended Approval:

1/19/22
Jay T. Akridge — Date
Provost and Executive Vice President for
Academic Affairs and Diversity

Approved:

11/22/22
Mitchell E. Daniels, Jr. — Date
President

Table 1
Program Financial Projection
Financial Office Table
West Lafayette
MS Interdisciplinary Studies: Applied Geospatial Analytics

	Year #1 FY 2023	Year #2 FY 2024	Year #3 FY 2025	Year #4 FY 2026	Year #5 FY 2027
I. ENROLLMENT					
1. Program Credit Hours Generated (PTE* 18) see row 116 for note					
a. Existing Courses	252	540	864	1080	1080
b. New Courses	0	0	0	0	0
Total	**252**	**540**	**864**	**1080**	**1080**
2. Full-Time Equivalents (FTE)					
a. Full-Time FTEs	0	0	0	0	0
b. Part-Time FTEs	14	30	48	60	60
Total Full/Part-Time FTE	**14**	**30**	**48**	**60**	**60**
c. On-Campus Transfer FTEs	0	0	0	0	0
d. New-to-Campus FTEs	0	0	0	0	0
Total On/New-to-Campus FTE	**0**	**0**	**0**	**0**	**0**
3. Program Majors - Headcount					
a. Full-Time Students	0	0	0	0	0
b. Part-Time Students	14	30	48	60	60
Total Full/Part-Time HC	**14**	**30**	**48**	**60**	**60**
c. In-State	4	8	12	15	15
d. Out-of-State	10	22	36	45	45
Total In/Out of State HC	**14**	**30**	**48**	**60**	**60**

Notes

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

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

Table 1
Program Financial Projection
Financial Office Table
West Lafayette
MS Interdisciplinary Studies: Applied Geospatial Analytics

	Year #1 FY 2023	Year #2 FY 2024	Year #3 FY 2025	Year #4 FY 2026	Year #5 FY 2027
II. INCREMENTAL REVENUE					
1. Projected # of *New* Students [1]	14	16	18	20	20
2. General Tuition & Fees [2]					
a. General Service (623.30/CR X 30 CR)	18,699	18,699	18,699	18,699	18,699
b. Technology Fee (7.55/CR X 30 CR)	227	227	227	227	227
c. Repair & Rehabilitation Fee (11.25/CR X 30 CR)	338	338	338	338	338
d. Student Fitness & Wellness Fee	-				
e. Student Activity Fee	-				
Total General Service T&F	**$ 19,263**	**$ 19,263**	**$ 19,263**	**$ 19,263**	**$ 19,263**
2. Additional Fees - *if applicable* [3]					
a. Differential Fees	-				
b. Course Fees	-				
c. Other Fees (DE Fee & F&A = 126.90/CR X 30 CR)	3,807	3,807	3,807	3,807	3,807
Total Additional Fees	**$ 3,807**	**$ 3,807**	**$ 3,807**	**$ 3,807**	**$ 3,807**
Total Incremental Revenue	**$ 322,980**	**$ 369,120**	**$ 415,260**	**$ 461,400**	**$ 461,400**

Notes

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

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

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

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

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

Table 1
Program Financial Projection
Financial Office Table
West Lafayette
MS Interdisciplinary Studies: Applied Geospatial Analytics

	Year #1 FY 2023		Year #2 FY 2024		Year #3 FY 2025		Year #4 FY 2026		Year #5 FY 2027	
III. EXPENDITURES										
1. Salary and Wages	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**	**FTE**	**Cost**
a. Faculty	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-
b. Limited Term Lecturers	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
c. Graduate Students	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-
d. Other (Post Doc/Staff)										
Total S&W	**0.00**	**$ -**	**0.00**	**$ -**	**0.00**	**$ -**	**0.00**	**$ -**	**0.00**	**$ -**
2. Fringes and Fee Remissions										
a. Fringe Benefits	0	0	0	0	0	0	0	0	0	0
b. Fee Remissions	0	0	0	0	0	0	0	0	0	0
Total FB & FR		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
3. Supplies and Expenses										
a. General Supplies & Expenses		-		-		-		-		-
b. Minor Equipment		-		-		-		-		-
c. Recruiting & Marketing (includes student support)		201,555		246,555		275,285		275,285		275,285
d. Travel & Entertainment		-		-		-		-		-
e. Other (Library, subscriptions, IT)		-		-		-		-		-
Total Supplies and Expense		**$ 201,555**		**$ 246,555**		**$ 275,285**		**$ 275,285**		**$ 275,285**
4. Capital										
a. Capitalized Equipment		-		-		-		-		-
b. Repair & Replacement		-		-		-		-		-
Total Equipment		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
Total Expenditures		**$ 201,555**		**$ 246,555**		**$ 275,285**		**$ 275,285**		**$ 275,285**
Projected Program Surplus/(Deficit)*		**$ 121,425**		**$ 122,565**		**$ 139,975**		**$ 186,115**		**$ 186,115**

***** For the CHE proposal, only identify the nature of the support. It is not necessary to note dollars in the report; however, it should be stated that there is sufficient revenue to cover expenses. Projected surplus/deficit is an aid to identify potential new University revenue, anticipated program costs, and degree substantiality. This does not represent any type of funding request.

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

Table 1
Program Financial Projection
Financial Office Table
West Lafayette
MS Interdisciplinary Studies: Applied Geospatial Analytics

FOOTNOTES	
I. Enrollment Details	
1. Program Credit Hours Generated	All courses are already existing. Assuming students will take 6 CR per semester x 3 semesters per year (18 CR per PTE per year).
2. Full-Time Equivalents (FTE)	All students are part-time
3. Program Majors - Headcount	This represents the total number of students expected to be enrolled in the program with fewer than 7 CR/semester.
II. Incremental Revenue Details	
1. Projected # of New Students	This represents the projected number of new students. We multiplied the tuition by 30 Credit Hours to capture the total tuition each student
2. General Tuition & Fees	Based on market-based price of $750/$775 (IN/OUT) before fees. The average rate is $769 per credit hour
3. Additional Fees - if applicable	Includes Tech, R&R, DE Fee for online courses and F&A
III. Expenditure Details	
1. Salary and Wages	All courses are taught by existing faculty. Because the courses are covered by existing programs and the enrollments are low, no new increme
2. Fringes and Fee Remissions	All courses are taught by existing faculty. Because the courses are covered by existing programs and the enrollments are low, no new increme
3. Supplies and Expenses	Includes estimated marketing expenses, as well as marketing staff support, student support, and recruiting estimates.
4. Capital	None needed.

Table 2
Program Revenue and Expenditure Summary
Board of Trustees Table
West Lafayette
MS Interdisciplinary Studies: Applied Geospatial Analytics

	Year #1 FY 2023	Year #2 FY 2024	Year #3 FY 2025	Year #4 FY 2026	Year #5 FY 2027
Total Incremental Revenue*	$ 322,980	$ 369,120	$ 415,260	$ 461,400	$ 461,400
Total Expenditures	$ 201,555	$ 246,555	$ 275,285	$ 275,285	$ 275,285
Projected Program Surplus/(Deficit)**	**$ 121,425**	**$ 122,565**	**$ 139,975**	**$ 186,115**	**$ 186,115**

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

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

Additional Departmental Footnotes:

Table 3
Projected Headcount and FTE Enrollment and Degrees Conferred
Board of Trustees & ICHE Table
West Lafayette
MS Interdisciplinary Studies: Applied Geospatial Analytics

	Year #1 FY 2023	Year # 2 FY 2024	Year # 3 FY 2025	Year # 4 FY 2026	Year # 5 FY 2027
Enrollment Projections (Headcount)	**14**	**30**	**48**	**60**	**60**
Enrollment Projections (FTE)	**14**	**30**	**48**	**60**	**60**
Degree Completions Projection	**0**	**14**	**16**	**18**	**20**