BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

Education Committee

Zoom Videoconference

Wednesday, April 16, 2025
11:30 a.m. – 12:30 p.m.

A. Calling of the Roll

B. Declaration of Conflicts

C. Proposed Consent Agenda:
   1. Approval of the February 6, 2025, Meeting Minutes of the Education Committee
   2. UW-Eau Claire: Approval of a Bachelor of Science in Assistive Systems and Robotics Engineering (ASRE)
   3. UW-Green Bay: Approval of a Bachelor of Science in Software Engineering
   4. UW-Madison: Approval of a Master of Science in Plant Science and Technology
   5. UW-Madison: Approval of a Doctor of Philosophy (Ph.D.) in Plant Science and Technology
   6. UW-Madison: Approval of a Doctor of Philosophy (Ph.D.) in Ecology and Evolutionary Biology
   7. UW-Madison: Approval of a Master of Science in Quantitative Economics
   8. UW-Whitewater: Approval of a Master of Science in Education (MSE) in Elementary Middle Education
   9. UW-Whitewater: Approval of a Bachelor of Science in Medical Sciences

D. UW-Oshkosh Academic Unit Realignment Update

E. ADA Title II Digital Accessibility Workgroup Update

Education Committee
April 16, 2025

Item C.2.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION) BACHELOR OF SCIENCE IN ASSISTIVE SYSTEMS AND ROBOTICS ENGINEERING, UNIVERSITY OF WISCONSIN–EAU CLAIRE

REQUESTED ACTION

Adoption of Resolution C.2., authorizing the implementation of the Bachelor of Science in Assistive Systems and Robotics Engineering at the University of Wisconsin–Eau Claire.

Resolution C.2. That, upon the recommendation of the Chancellor of the University of Wisconsin–Eau Claire and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Bachelor of Science in Assistive Systems and Robotics Engineering program at the University of Wisconsin–Eau Claire.

SUMMARY

The University of Wisconsin–Eau Claire (UW-Eau Claire) proposes to establish a Bachelor of Science (B.S.) in Assistive Systems and Robotics Engineering (ASRE). The B.S. in Assistive Systems and Robotics Engineering applies fundamental robotics engineering principles to directly help individuals perform tasks that might be difficult or impossible otherwise, including robotics for daily personal tasks, personal mobility, rehabilitation, and communication. This is a growing field as needs in healthcare, rehabilitation, and assistive devices intersect with increased computing power, artificial intelligence, and high-performance sensors. The global medical robotics market was worth $16 billion in 2024, and it is expected to grow at a rate of 16% through 2032.[1] The healthcare assistive robotics

[1] Medical Robots Market by Product & Service (Instruments & Accessories, Robotic Systems), Type (Surgical (Soft: General, Gynecological, Urological; Hard: Knee & Hip, Spine), Rehab, Radiosurgery, Hospital & Pharmacy), End User & Region - Global Forecasts to 2029, Medical Robots Market, March 2024, Report Code MD 2257

market size was about $524 million in 2022 and expected to reach $3.2 billion in 2032.[2] Robotics engineers provide the workforce with the ability to integrate the available technology with the desired applications. The rationale for the new degree is to provide students with the education and training to use physics, data analysis, engineering, and computer science to use software and mechanical hardware to design, build, and test robotics. With this educational background, students will be well prepared to develop assistive systems and work in the robotics industry. The proposed program is a component of UW-Eau Claire's Workforce Development plan.

The proposed B.S. in ASRE will require 128 credits, including 36 credits in general education (Liberal Education Core or LE Core) and 92 credits in the major. The major equips students with knowledge and skills in computer science, math, materials science and engineering, and physics, including control systems, applications of sensors, actuators, and embedded controllers, and modeling, analysis, and design of systems that integrate hardware and software to control mechanical systems. Students will benefit from high impact practices including capstone courses as well as opportunities to participate in undergraduate research with faculty and internships with industrial partners. The overall demand for engineers is expected to grow 7% between 2022 and 2032, more than double the total for all occupations at 3%. The U.S. Bureau of Labor Statistics currently lists robotics engineers as a subcategory of mechanical engineers. Mechanical engineers have a projected 10% increase in employment opportunities, over three times the total of all occupations for the same period. There is also high demand in Wisconsin, with 465 currently available robotics engineering positions. In support of future market demand, the Northeast Wisconsin Manufacturing Alliance surveyed 66 manufacturers in the area for the Industry 4.0 Needs, Skills and Talent Survey in 2021. Seventy-nine percent (79%) of companies that responded were investing in robotics, and the top two skills desired were cybersecurity and automation and robotics. [3]

Presenter

- Dr. Michael Carney, Interim Provost and Vice Chancellor for Academic Affairs

[2] Healthcare Assistive Robot Market - By Product (Surveillance & Security, Humanoid, Rehabilitation, Socially Assistive), By Portability (Fixed Base, Mobile), By Application (Stroke, Orthopedics, Cognitive & Motor Skills, Sports) & Forecast, 2023 – 2032, Global Market Insights, May 2023, Report GMI1114

[3] New Manufacturing Alliance. Industry 4.0 Needs Survey 2021. Retrieved at https://newmfgalliance.org/industry-needs-survey/, accessed 12/18/24 (March 2022)

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting (Revised August 2023), available at https://www.wisconsin.edu/uw-policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

REQUEST FOR AUTHORIZATION TO IMPLEMENT A BACHELOR OF SCIENCE IN ASSISTIVE SYSTEMS AND ROBOTICS ENGINEERING AT THE UNIVERSITY OF WISCONSIN–EAU CLAIRE PREPARED BY UW–EAU CLAIRE

ABSTRACT

The University of Wisconsin–Eau Claire (UW-Eau Claire) proposes to establish a Bachelor of Science (B.S.) in Assistive Systems and Robotics Engineering (ASRE). The B.S. in Assistive Systems and Robotics Engineering applies fundamental robotics engineering principles to directly help individuals perform tasks that might be difficult or impossible otherwise, including robotics for daily personal tasks, personal mobility, rehabilitation, and communication. This is a growing field as needs in healthcare, rehabilitation, and assistive devices intersect with increased computing power, artificial intelligence, and high-performance sensors. The global medical robotics market was worth $16 billion in 2024, and it is expected to grow at a rate of 16% through 2032.[1] The healthcare assistive robotics market size was about $524 million in 2022 and expected to reach $3.2 billion in 2032.[2] Robotics engineers provide the workforce with the ability to integrate the available technology with the desired applications. The rationale for the new degree is to provide students with the education and training to use physics, data analysis, engineering, and computer science to use software and mechanical hardware to design, build, and test robotics. With this educational background, students will be well prepared to develop assistive systems and work in the robotics industry. The proposed program is a component of UW-Eau Claire's Workforce Development plan.

The proposed B.S. in ASRE will require 128 credits, including 36 credits in general education (Liberal Education Core or LE Core) and 92 credits in the major. The major equips students with knowledge and skills in computer science, math, materials science and engineering, and physics, including control systems, applications of sensors, actuators, and embedded controllers, and modeling, analysis, and design of systems that integrate hardware and software to control mechanical systems. Students will benefit from high impact practices including capstone courses as well as opportunities to participate in

[1] Medical Robots Market by Product & Service (Instruments & Accessories, Robotic Systems), Type (Surgical (Soft: General, Gynecological, Urological; Hard: Knee & Hip, Spine), Rehab, Radiosurgery, Hospital & Pharmacy), End User & Region - Global Forecasts to 2029, Medical Robots Market, March 2024, Report Code MD 2257

[2] Healthcare Assistive Robot Market - By Product (Surveillance & Security, Humanoid, Rehabilitation, Socially Assistive), By Portability (Fixed Base, Mobile), By Application (Stroke, Orthopedics, Cognitive & Motor Skills, Sports) & Forecast, 2023 – 2032, Global Market Insights, May 2023, Report GMI1114

undergraduate research with faculty and internships with industrial partners. The overall demand for engineers is expected to grow 7% between 2022 and 2032, more than double the total for all occupations at 3%. The U.S. Bureau of Labor Statistics currently lists robotics engineers as a subcategory of mechanical engineers. Mechanical engineers have a projected 10% increase in employment opportunities, over three times the total of all occupations for the same period. There is also high demand in Wisconsin, with 465 currently available robotics engineering positions.[3] In support of future market demand, the Northeast Wisconsin Manufacturing Alliance surveyed 66 manufacturers in the area for the Industry 4.0 Needs, Skills and Talent Survey in 2021. Seventy-nine percent (79%) of companies that responded were investing in robotics, and the top two skills desired were cybersecurity and automation and robotics. [4]

PROGRAM IDENTIFICATION

University Name
University of Wisconsin–Eau Claire

Title of Proposed Academic Program
Assistive Systems and Robotics Engineering

Degree Designation
Bachelor of Science

Suggested Classification of Instructional Programs (CIP) Code:
14.4201- Mechatronics, Robotics, and Automation Engineering

Mode of Delivery
Single institution; in-person modality

Department or Functional Equivalent
Department of Physics and Astronomy

College, School, or Functional Equivalent
College of Arts and Sciences

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[3] ZipRecruiter, Robotics Engineer Jobs. Retrieved at https://www.ziprecruiter.com/Jobs/Robotics-Engineer/--in-Wisconsin (December 18, 2024)

[4] New Manufacturing Alliance. Industry 4.0 Needs Survey 2021. Retrieved at https://newmfgalliance.org/industry-needs-survey/, accessed 12/18/24 (March 2022)

Proposed Date of Authorization
Spring 2025

Proposed Date of Implementation
Fall 2025

PROGRAM INFORMATION

Overview of the Program

The B.S. in Assistive Systems and Robotics Engineering program (ASRE) will provide students with the knowledge and skills needed to work in industries designing, building, and testing robotics for use in healthcare, assistive systems, and other related industries. The B.S. in ASRE applies fundamental robotics engineering principles to directly help individuals to perform tasks that might be difficult or impossible otherwise. Some examples include robotics to help elderly individuals and people with disabilities live independent lives (robotics for daily tasks) and fully participate in society (robotics that allow individuals mobility to access public spaces); to help individuals rehabilitate from injuries or disease in clinical settings but could include access to physical therapy in the home and in areas without ready access to physical therapy; and to help children with autism spectrum disorder learn social skills and improve communication. Unlike robotics in automation, these assistive robotics systems are designed for the individual and rely on the human-robotics interface in the design process.

The major is designed to meet the ABET (formerly Accreditation Board for Engineering and Technology) Accreditation requirements for the Engineering Accreditation Commission for the Mechatronics, Robotics, and Similarly Named Engineering Programs.

The focus on the application of robotics engineering to health care and assistive systems is emphasized in two primary areas and then embedded throughout the curriculum. The introductory course in the major (ASRE 150) will emphasize the human-robotics interface, introducing students to how the characteristics of the user can influence design requirements, and how to investigate and address the user's needs from a sociotechnical context. The capstone projects at the end of the curriculum (ASRE 486, 487) will provide opportunities for students to demonstrate their competency in designing assistive robotics. In addition to collaboration with Mayo Clinic for capstone projects, discussions have already taken place for capstone project ideas with the Eau Claire Aging and Disability Resource Center and the Eau Claire County Veteran Services office. Capstone project ideas will be solicited from other medical clinics, assisted living centers, and nursing homes. There will also be the opportunity for interdisciplinary capstone projects with Biomedical Engineering majors. In major courses focused on programming, electronics, sensors, actuators and control systems universal to robotics engineering, application to

assistive systems will be integrated throughout the courses as examples and assignment/project options.

The B.S. in ASRE program will leverage existing courses in Computer Science (15 credits), Math (20 credits), Materials Science and Engineering (9 credits), Physics (29 credits) and new ASRE courses (21 credits). New courses in control systems, applications of sensors, actuators, and embedded controllers, and modeling, analysis and design of systems that integrate hardware and software to control mechanical systems will be developed as part of this new major. Students will also have opportunities to complete selected science and engineering electives, in addition to undergraduate research and internship experiences to round out their degree. All bachelor's degree requirements including the liberal education coursework (LE Core) can be accommodated within a four-year, 128-credit degree program, which is the standard credit total for an ABET accredited program.

Students in the major will have opportunities to participate in student-faculty collaborative research. The program will work with industrial partners to ensure the curriculum remains current and to develop internship and capstone opportunities. The two-semester capstone sequence provides a built-in high impact practice for hands-on learning and open-ended problem solving.

Projected Enrollments and Graduates by Year Five

Table 1 represents enrollment and graduation projections for students entering the B.S. in ASRE program over the next five years, beginning in 2025. Due to having limited time to market the program to prospective students, a small Year 1 class of students new to UW-Eau Claire is expected. Based on previous experience launching the biomedical engineering program, it is anticipated that a small number of existing students may switch to the program from related majors during the first year. An intentional and targeted recruitment plan should result in a higher number of new students enrolling at UW-Eau Claire in fall 2026 with the B.S. in ASRE as their declared program. The estimate of 25 new students per year beginning in Year 2 is consistent with first-time, full-time student enrollments in the biomedical engineering program of 28 students in Year 1, 34 students in Year 2, and 31 students in Year 3. University-wide, student retention rates from the point of entry until after the freshman, sophomore, and junior years are 82%, 72%, and 65%, respectively. It is expected that graduation rates will be consistent with the averages for UW-Eau Claire students of 45.2% in four (4) years, 62.1% in five (5) years, and 66% in six (6) years. By the end of Year 5, it is anticipated that 112 students will have enrolled in the program and 41 students will have graduated with a B.S. in ASRE from UW-Eau Claire.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	12	25	25	25	25
Continuing Students	10	18	37	47	54
Total Enrollment	22	43	62	72	79
Graduating Students	0	0	7	8	26

Tuition Structure

For students enrolled in the program in their freshman and sophomore years (up to 60 earned credits), standard tuition applies. B.S. in ASRE students in their junior and senior years (more than 60 credits) will pay a program-specific tuition rate for engineering. For the 2024-25 academic year, residential tuition and fees total $4,891.28 per semester for a full-time student enrolled in 12-18 credits per semester. Of this amount, $3,965.70 is attributable to tuition, $855.58 is attributable to segregated fees, and $70 is the textbook rental fee. Nonresident tuition and fees total $9,684.30 per semester for a full-time student enrolled in 12-18 credits per semester. Of this amount, $8,758.72 is attributable to tuition, $855.58 is attributable to segregated fees, and $70 is the textbook rental fee. Part-time students will pay at the per credit tuition and fee rate of $407.61 for in-state and $807.02 for non-resident.

Consistent with the tuition structure in UW-Eau Claire engineering programs, resident B.S. in ASRE students will pay the program-specific tuition rate for engineering in their junior and senior years. For the 2024-25 academic year, the resident program-specific tuition and fees for engineering programs total $5,617.53 per semester for full time students. Of this amount, $4,691.95 is attributed to program-specific tuition, $855.58 for segregated fees, and $70 textbook rental fee. Full-time, non-resident B.S. in ASRE students in their junior and senior years will pay $10,488.50 per semester in program-specific tuition and fees. Of this amount, $9,562.92 is attributable to program-specific tuition, $855.58 in segregated fees, and $70 textbook rental fee.

Student Learning and Program Outcomes

Upon completing the B.S. in ASRE program, students will have demonstrated their mastery of the ABET-defined learning outcomes[5] and will be able to:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

[5] ABET. Criteria for Accrediting Engineering Programs, 2025-2026. https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2025-2026/

- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

Within a few years of receiving their undergraduate degree, graduates from UW-Eau Claire's B.S. in ASRE program are expected to be able to:

1. Use emerging engineering technologies to create new ideas and novel solutions for assisting individuals.
2. Demonstrate leadership, problem-solving proficiency, critical-thinking, and creativity in managing challenges in the healthcare and assistive robotics field.
3. Develop designs informed by healthcare needs, innovate novel robotics systems, and develop assistive systems and devices.
4. Contribute to the research objectives of academic and healthcare facilities; and collaborate with interdisciplinary teams.
5. Embrace the learning process as a lifelong endeavor.

Program Curriculum

Students new to UW-Eau Claire (including first-year and transfer students) will be eligible to declare a major in ASRE upon admission. No additional exams, other than those already taken by students during admission to UW-Eau Claire, will be required. Continued enrollment in the major will require students to maintain the same level of performance that all UW-Eau Claire students must meet to remain in "good standing."

The curriculum for the B.S. in ASRE major relies heavily on current courses in Engineering, Physics, and Computer Science. Six new courses specific to robotics (21 credits) and ABET requirements will build on the foundation of the courses offered by the other departments. Two capstone courses are an essential part of the curriculum for this major. Students in capstone courses go through the design process for an open-ended project as a small group, and they engage in a hands-on iterative experience where students demonstrate their mastery of the skills needed to be a professional engineer. The

capstone courses will follow the model currently used in the ABET-accredited Biomedical Engineering and Materials Science and Engineering programs.

Table 2 illustrates the 128-credit curriculum for the proposed major, which includes a minimum of 92 required credits in the major from a combination of prerequisites (36 credits) and major course requirements (60 credits), and an additional 36 credits to fulfill LE Core requirements not met by courses taken in the major.

Table 2: Bachelor of Science in Assistive Systems and Robotics Engineering Curriculum

General education courses required for graduation:	
LE Core credits need to meet University requirements:	36 credit(s)
Major Requirements: Required ASRE Program prerequisites or support courses (32 credits):	
Chem 105 (General Chemistry I)	3 credits
Chem 106 (General Chemistry I lab)	2 credits
Math 114 (Differential Calculus)	4 credits
Math 215 (Integral Calculus)	4 credits
Math 312 (Differential Equations and Linear Algebra)	4 credits
Phys 231 (University Physics I)	5 credits
Phys 232 (University Physics II)	5 credits
CS 140 (Intro to Computer Science)	5 credits
Major Requirements: Academic degree program or major course requirements (60 credits):	
CS 145 (Object Oriented Programming)	4 credits
CS 245 (Data Structures and Algorithms)	4 credits
AI 420 (Artificial Intelligence)	4 credits
MSE 120 (Intro to Engineering)	2 credits
MSE 256 (Intro to Computer Aided Design)	1 credit
MSE 286 (Sophomore Seminar)	1 credit
MSE 307 (Engineering Statistics)	4 credits
MSE 386 (Junior Seminar)	1 credit
Physics 255 (Statics)	3 credits
Physics 350 (Electric and Electronic Circuits)	4 credits
Physics 356 (Dynamics)	4 credits
Physics 360 (Electronics)	4 credits
Phys 361 (LabVIEW Basics)	2 credits
Phys 362 (LabVIEW Applications)	2 credits
Phys 363 (LabVIEW cRIO)	1 credit
ASRE 150 (Intro to Robotics)	3 credits
ASRE 300 (Sensors)	4 credits
ASRE 310 (Control Systems)	4 credits

ASRE 400 (Integration of Hardware and Software)	4 credits
ASRE 486 (Senior Capstone 1)	2 credits
ASRE 487 (Senior Capstone 2)	2 credits
Total Credits	**128 credits**

Note: The LE Core requires a minimum of 18 learning experiences in 12 areas (seven learning experiences in four "Knowledge" areas, four learning experiences in three "Skills" areas, four learning experiences in three "Responsibility" areas, two learning experiences in "Integration", and the University Service-Learning requirement). These courses are collectively indicated in Table 2 as LE Core credits. Note that credits earned in CHEM 105, PHYS 231 and MATH 114 count towards both the major and the LE Core.

Collaborative Nature of the Program

The B.S. in ASRE involves the collaboration of the Computer Science, Materials Science and Biomedical Engineering, and Physics and Astronomy Departments. A committee with a representative from each of the departments will provide guidance for the program. In such a rapidly changing field, this collaboration will allow efficient communication between the primary departments so that curriculum can reflect the needs of the field.

The program will collaborate with local healthcare institutions including Mayo Clinic Health System, Marshfield Clinic, and Dove Healthcare and disability support agencies such as the Aging and Disability Resource Center of Eau Claire County for Senior Capstone projects that will allow students to design personal assistive devices to address real needs.

In preparing for this program's authorization, the dean of the UW-Eau Claire College of Arts and Sciences reached out to dean colleagues with related programs at UW-Platteville, UW-River Falls, and UW-Stout to inquire about interest in exploring collaborations on research and capstone projects for students across Universities of Wisconsin programs. The dean of the College of Science, Technology, Mathematics and Management at UW-Stout responded with interest in exploring such collaborations.

Projected Time to Degree

A student can complete the B.S. in ASRE degree, including all liberal education and other UW-Eau Claire graduation requirements, in eight semesters with an average load of 16 credits per semester and full-time enrollment. Based on enrollment rates in similar majors, nearly all students are expected to be full-time. Students who transfer to UW-Eau Claire, and who were enrolled in an engineering program at similar institutions can also typically complete the degree in eight total semesters. It is anticipated that nearly all students in the program will be enrolled full-time based on rates in similar programs.

Accreditation

The B.S. in ASRE curriculum is designed to meet the strict ABET accreditation standards. The B.S. in ASRE program will be the third program at UW-Eau Claire seeking accreditation by the ABET Engineering Accreditation Commission (EAC), and it will use the newly developed Mechatronics, Robotics and Similarly Named Engineering Programs

criteria. An ABET Readiness Review and full accreditation will be requested after the first student cohort completes the B.S. in ASRE program (anticipated to be during the 2028-2029 academic year). Similar to UW-Eau Claire's experience in receiving ABET accreditation for the Biomedical Engineering and Materials Science and Engineering programs, it is anticipated the site visit will require at least 18 months of preparation in the form of assessment data collection, student artifact collection, and related documentation (e.g., faculty CVs, course syllabi, etc.) before the team arrives. No separate approval from HLC is required.

JUSTIFICATION

Rationale

A skilled workforce, educated in robotics, is required to design and implement expanding technologies in healthcare and assistive systems. Robotics are increasingly common in healthcare applications including precision robotic surgery, rehabilitation, telepresence, pharmacy, social assistance, imaging assistance, and interventional assistance.[6] Assistive systems are products, equipment, and systems that enhance learning, working and daily living for individuals, especially for those with disabilities or limitations. Robotics are also being used in educational environments, such as helping neurodiverse students develop social skills.[7] Students completing the B.S. in ASRE program will have a strong background in the areas of electrical, computer and mechanical engineering, and in the integration of these disciplines necessary to design robots to be used in these applications. The program also supports the 2025 University Plan commitment to "support existing and develop new programs that attract students and serve the needs of Wisconsin."[8]

Institution and Universities of Wisconsin Program Array

The proposed B.S. in ASRE program aligns very well with the existing array of programs at UW-Eau Claire. The B.S. in ASRE is a logical additional engineering major as it complements UW-Eau Claire's successful engineering programs established in 2016 (Materials Science and Engineering) and 2021 (Biomedical Engineering). Robotics

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[6] Morgan, A.A. et. al. Robots in Healthcare: a Scoping Review. Retrieved at https://pmc.ncbi.nlm.nih.gov/articles/PMC9589563/

[7] Kouroupa A, Laws KR, Irvine K, Mengoni SE, Baird A, Sharma S. The use of social robots with children and young people on the autism spectrum: A systematic review and meta-analysis. PLoS One. 2022 Jun 22;17(6):e0269800. doi: 10.1371/journal.pone.0269800. PMID: 35731805; PMCID: PMC9216612.

[8] A Bold Future: 2025 Strategic Plan. Retrieved at https://publicwebuploads.uwec.edu/documents/Strategic-Plan-2025-booklet-for-web.pdf

Engineering relies on many of the same foundational courses as Materials Science and Engineering (physics, math, materials, engineering statistics) and Biomedical Engineering (math, physics, engineering statistics, electronics). The assistive systems and healthcare applications of robotics align very well with Biomedical Engineering applications. Since all robotics need to meet materials constraints, there is also close alignment with the Materials Science and Engineering program, including emerging applications of materials for soft robotics.[9]

Review of the UW System Academic Majors dashboard identified no existing programs in the Universities of Wisconsin that offer majors under the ABET Mechatronics, Robotics and Similarly Named Engineering Programs criteria. UW-Oshkosh offers a B.S. in Automation Engineering with the same CIP code (14.4201), but the program focuses on automation applied to the manufacturing process and not on the assistive systems and healthcare applications emphasis in the B.S. in ASRE program. UW-Stout offers engineering majors – Plastics Engineering (CIP code 14.3201), Manufacturing Engineering (CIP code 14.3601), Mechanical Engineering (CIP code 14.1901), and Computer and Electrical Engineering (CIP code 14.4701) that include courses in robotics, but there is not a program that focuses on robotics engineering for application in assistive systems.

Need as Suggested by Current Student Demand

UW-Eau Claire is a popular destination for students interested in academic disciplines associated with STEM. The first engineering programs at UW-Eau Claire were Materials Science and Engineering (2016) and Biomedical Engineering (2021). As evidenced by the rapid growth and current enrollment of 170 students in these two majors, there is very strong interest in engineering majors among UW-Eau Claire students. The proposed B.S. in ASRE program will allow students to integrate aspects of mechanical engineering, computer engineering, and electrical engineering in one major, and to apply those principles in assistive systems and healthcare applications.

Increasing participation in pre-college programs involving robotics also makes a major in this area attractive to incoming students. Unlike many engineering disciplines, a significant number of students have pre-college experience with aspects of robotics engineering through programs like First Robotics. In Wisconsin, there are over 65 high schools with teams involved in First Robotics competitions. These programs were developed to introduce high school students to STEM careers, and the proposed major allows students to continue their interest in robotics into an undergraduate engineering degree focused on assistive devices.

[9] Shukun Yin, Dickson R. Yao, Yu Song, Wenzheng Heng, Xiaotian Ma, Hong Han, Wei Gao. Wearable and Implantable Soft Robots. *Chem. Rev.* 2024, 124, 11585−11636. doi: 10.1021/acs.chemrev.4c00513

Need as Suggested by Market Demand

The demand for engineers remains very strong. Overall demand for engineers is expected to grow 7% between 2022 and 2032, more than double the total for all occupations at 3%. The U.S. Bureau of Labor Statistics Occupational Outlook Handbook currently lists Robotics Engineers as a subcategory of Mechanical Engineers. Mechanical Engineers have a projected 10% increase in employment, over three times the total of all occupations for the same period.[10] The global medical robotics market is worth $16 billion in 2024 and expected to grow at a rate of 16% through 2032.[11] The healthcare assistive robotics market size was about $524 million in 2022 and expected to reach $3.2 billion in 2032.[12]

The operational stock of industrial robots has increased by an average of 13% every year since 2017. According to the Society of Mechanical Engineers (SME), "companies are seeking highly skilled robotics engineers with expertise in areas such as machine learning (ML), control systems, artificial intelligence (AI) and computer vision, who can design, develop and maintain robots, as well as ensure their safety and efficiency." [13] In addition to manufacturing, the growth of robotics in healthcare has increased rapidly with robots being designed to assist in surgery (DaVinci is one of 19 named surgical robots) to over 100 named robots to assist in rehabilitation and mobility.[14] In Wisconsin, there are currently 465 currently available robotics engineering positions that are listed, with an average salary

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[10] Bureau of Labor Statistics, US Department of Labor, Occupational Outlook Handbook, Mechanical Engineers : Occupational Outlook Handbook: : U.S. Bureau of Labor Statistics (bls.gov) (visited April 26, 2024)

[11] Medical Robots Market by Product & Service (Instruments & Accessories, Robotic Systems), Type (Surgical (Soft: General, Gynecological, Urological; Hard: Knee & Hip, Spine), Rehab, Radiosurgery, Hospital & Pharmacy), End User & Region - Global Forecasts to 2029, Medical Robots Market, March 2024, Report Code MD 2257

[12] Healthcare Assistive Robot Market - By Product (Surveillance & Security, Humanoid, Rehabilitation, Socially Assistive), By Portability (Fixed Base, Mobile), By Application (Stroke, Orthopedics, Cognitive & Motor Skills, Sports) & Forecast, 2023 – 2032, Global Market Insights, May 2023, Report GMI1114

[13] Marley, B. Robotics: Paving the Way for Next Gen Careers. Retrieved at https://www.advancedmanufacturing.org/leadership-innovation/robotics-paving-the-way-for-next-gen-careers/article_56703dd0-1a02-11ef-927e-135a998e259d.html#:~:text=The%20Bureau%20of%20Labor%20Statistics,growth%20rate%20for%20all%20occupations.

[14] Morgan, A.A. et. al. Robots in Healthcare: a Scoping Review. Retrieved at https://pmc.ncbi.nlm.nih.gov/articles/PMC9589563/

of $106,593 for a robotics engineer in Wisconsin.[15] In support of future market demand, the Northeast Wisconsin Manufacturing Alliance surveyed 66 manufacturers in the area for the Industry 4.0 Needs, Skills and Talent Survey in 2021. Seventy-nine percent (79%) of companies who responded were investing in robotics and the top two skills desired were cybersecurity and automation and robotics. [16]

[15] ZipRecruiter, Robotics Engineer Jobs. Retrieved at https://www.ziprecruiter.com/Jobs/Robotics-Engineer/--in-Wisconsin (December 18, 2024)

[16] New Manufacturing Alliance. Industry 4.0 Needs Survey 2021. Retrieved at https://newmfgalliance.org/industry-needs-survey/, (March 2022)

University of Wisconsin–Eau Claire Cost and Revenue Projections For B.S. in Assistive Systems and Robotics Engineering						
	Items	**Projections**				
		2025-26	**2026-27**	**2027-28**	**2028-29**	**2029-30**
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
I	**Enrollment (New Student) Headcount**	12	25	25	25	25
	Enrollment (Continuing Student) Headcount	10	18	37	47	54
	Enrollment (New Student) FTE	12	25	25	25	25
	Enrollment (Continuing Student) FTE	10	18	37	47	54
II	**Total New Credit Hours**	66	219	363	411	411
	Existing Credit Hours	572	938	1258	1482	1706
III	**FTE of New Faculty/Instructional Staff**	2	2	2	2	2
	FTE of Current Fac/IAS					
	FTE of New Admin Staff					
	FTE Current Admin Staff					
IV	**Revenues**					
	Tuition	$47,588	$213,871	$337,983	$431,822	$497,509
	Fees (indicate type)					
	Program Revenue (Grants)					
	Program Revenue - Other					
	GPR (re)allocation	$298,165	$298,165	$298,165	$298,165	$298,165
	Total Revenue	**$345,753**	**$512,036**	**$636,148**	**$729,987**	**$795,674**
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary (assume 2% annual increase)	$180,000	$183,600	$187,272	$191,017	$194,838
	Instuctional Academic Staff					
	Administrative and Student Support Staff					
	Other Staff					
	Fringe Faculty and Academic Staff (42.5%)	$76,500	$78,030	$79,591	$81,182	$82,806
	Fringe University Staff					
	Fringe Other Staff					
	Facilities and Capital Equipment					
	University buildings and space					
	Capital Equipment					
	Operations					
	Other Expenses					
	Lab equipment, accreditation, student travel	$50,089	$56,352	$70,877	$85,402	$92,664
	Needs-based scholarship	$1,000	$1,000	$1,000	$1,000	$1,000
	Total Expenses	**$307,589**	**$318,982**	**$338,740**	**$358,602**	**$371,308**
	Net Revenue	**$38,164**	**$193,054**	**$297,408**	**$371,385**	**$424,366**

Provost's Signature: **Date:**

12/13/2024

Chief Business Officer's Signature: **Date:**

12/13/2024

COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN–EAU CLAIRE
BACHELOR OF SCIENCE IN ASSISTIVE SYSTEMS AND ROBOTICS ENGINEERING

PROGRAM INTRODUCTION

The University of Wisconsin (UW)–Eau Claire proposes to establish a Bachelor of Science (B.S.) in Assistive Systems and Robotics Engineering (ASRE). The new degree will provide students with the education and training to use physics, data analysis, engineering, computer science, and software and mechanical hardware to design, build, and test robotics for application as assistive devices in healthcare and related settings. Assistive Systems and Robotics Engineering applies fundamental robotics engineering principles to directly help individuals perform tasks that might be difficult or impossible otherwise, including robotics for daily personal tasks, personal mobility, rehabilitation, and communication. The program will operate on UW-Eau Claire's standard tuition model for students in the first and second years of the program. Students who have completed more than 60 credits will pay the program-specific tuition rate for engineering, which includes an additional tuition of $726.25 per semester in 2024-25. This program is a component of UW-Eau Claire's Workforce Development Plan, and new faculty positions will be funded using Workforce Development funding.

COST REVENUE NARRATIVE

Section I – Enrollment

As indicated in the authorization and cost and revenue workbook, 12 new students are anticipated in Year 1 since there will be limited time to market the program to prospective students. Ten (10) current UW-Eau Claire students are anticipated to change to the B.S. in ASRE in the first year from related majors. In each of the following years, it is estimated that 25 new students will enroll in the program. It is anticipated that students will attend the program full time.

Per the Approval to Plan for a B.S. in Robotics Engineering that was issued by the Universities of Wisconsin Office of Academic Affairs on September 6, 2024, the enrollment plan ensures that enrollment will be limited to approximately 80 students, consistent with UW-Eau Claire's commitment to produce approximately 20 engineering graduates per year for this high demand career field once the program has matured.

Section II – Credit Hours

New credit hours are defined as those generated through enrollment in new courses associated with the B.S. in ASRE program (those with an ASRE prefix). Because the foundational courses are shared with other programs, only one ASRE course will be taught in Year 1 (with enrollment consisting of new students and a small number of students who may move from an existing major to ASRE as accounted for in the authorization). Three courses will be taught in Year 2 when students switching from related majors will first need ASRE courses at the 300-level. Six ASRE courses will be taught in each subsequent year. Course enrollments in Years 2-5 reflect anticipated enrollment as presented in the authorization. Initially, ASRE students will be accommodated in existing sections of foundational courses. As enrollment grows, sections of foundational courses will be added as needed. UW-Eau Claire's centralized model of allocating instructional resources allows for reallocation of teaching resources to areas with growing enrollment. Because several LE core courses are intertwined with major requirements. LE was included in the calculation of existing credits. Existing credits were determined by calculating a 16-credit load per student and subtracting credits attributable to the ASRE major.

Section III – Faculty and Staff Appointments

The B.S. in ASRE program will utilize existing UW-Eau Claire instructional resources for courses in Computer Science, Mathematics, Materials Science and Engineering, and Physics. To support the B.S. in ASRE program, it will be necessary to hire 2.0 new FTE faculty with expertise in robotics in the Department of Physics and Astronomy to start fall 2025.

Section IV – Program Revenues

For students enrolled in the program in their freshman and sophomore years (up to 60 earned credits), standard tuition applies. B.S. in ASRE students in their junior and senior years (more than 60 credits) will pay the engineering program-specific tuition rate, which includes an additional tuition of $726.25 per semester in 2024-25.

Tuition revenues corresponding to the student FTE projections are not assigned directly to the program or to the college. On the UW–Eau Claire campus, all GPR dollars are centrally managed at the university administration level and allocated to programs as needed to support general education as well as the instructional needs of specific programs.

Additional engineering program-specific tuition paid by junior and seniors will go directly to the B.S. in ASRE program. Program-specific tuition revenue from students enrolled in their junior and senior years will be used by the department for anticipated costs associated with maintaining and delivering the specialized upper-level laboratory curriculum in the major.

Tuition

For students enrolled in the program in their freshman and sophomore years (up to 60 earned credits), standard tuition applies. For the 2024-25 academic year, residential tuition and fees total $4,891.28 per semester for a full-time student enrolled in 12-18 credits per semester. Of this amount, $3,965.70 is attributable to tuition, $855.58 is attributable to segregated fees, and $70 is the textbook rental fee. B.S. in ASRE students in their junior and senior years (more than 60 credits) will pay a program-specific tuition rate for engineering. For 2024-25 academic year, the resident program-specific tuition and fees for engineering programs total $5,617.53 per semester for full time students. Of this amount, $4,691.95 is attributed to program-specific tuition, $855.58 for segregated fees, and $70 textbook rental fee.

Tuition revenue in each year is assumed to be resident undergraduate tuition, for the headcounts of new and continuing students, then adjusted by the number of students who are expected to be juniors and seniors (more than 60 credits). Tuition for students with less than 60 credits is adjusted by half to account for classes that are taken outside the major. Tuition for students with more than 60 credits is based on program-specific tuition for engineering. The expected amount of engineering program-specific tuition that will be invested directly in the B.S. in ASRE program is shown in the bottom of the table. Segregated fees and textbook fees are not included in the calculation.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
New Students	12	25	25	25	25
Continuing Students	10	18	37	47	54
Total Enrollment	22	43	62	72	79
Graduating Students	0	0	7	8	26

Table 1: Five Year Tuition Estimates, including Engineering Additional Tuition, based on Estimated Class Standing

Fresh/Soph Students <60 credits	22	35	45	45	45
Juniors and Seniors >60 credits		8	17	27	34
Total Enrollment	22	43	62	72	79
Tuition students <60 credits	$ 47,588	$ 138,800	$ 178,457	$ 178,457	$ 178,457
Tuition JR/SR >60 credits	$ -	$ 75,071	$ 159,526	$ 253,365	$ 319,053
Total Tuition	$ 47,588	$ 213,871	$ 337,983	$ 431,822	$ 497,509
Tuition to ASRE program:		$ 11,620	$ 24,693	$ 39,218	$ 49,385

Adjusted for half to capture program tuition and not tuition from LE

Fees

There are no program specific student fees planned for the program at this time.

Program Revenues and GPR

The program will be staffed by GPR positions awarded to UW-Eau Claire through the Workforce Development program, which includes funding for 2.0 FTE (salary and fringe) and $50,089 for equipment and supplies.

Section V – Program Expenses

Salary and Fringe

UW-Eau Claire is in the process of hiring 2.0 FTE new faculty members with expertise in robotics in the Physics and Astronomy Department in the College of Arts and Sciences. Using GPR Workforce Development funding, a salary of $90,000 and $38,250 budgeted for fringe is planned for each position. Fringe was calculated using the composite rate of 42.5%. The budget assumes 2% annual pay plans in years 2026-27 to 2029-30.

Facilities and Capital Equipment

No new or additional capital or facilities expenses are anticipated other than equipment outlined below.

Other Expenses

Expected expenses include new faculty start-up expenses and equipment in robotics laboratories, annual accreditation fees, and summer salary for accreditation efforts. Expenses for student capstone projects are expected and include travel to conferences and expenses for software. In addition, it is planned to award one needs-based scholarship of $1,000 per year. Please note that the program expense budget is expected to fully spend the Workforce Development supplies funding and engineering additional tuition each year.

Section VI – Net Revenue

In summary, the budget projections estimate positive “Net Revenue” in each of the five years. As noted above, all GPR funds are centrally managed by university administration. As such this positive net revenue is expected to support programs as needed to support general education as well as the needs of specific programs.

University of Wisconsin-Eau Claire

105 Garfield Avenue • P.O. Box 4004 • Eau Claire, WI 54702-4004

December 13, 2024

Jay Rothman, President
Universities of Wisconsin
1720 Van Hise Hall
1220 Linden Drive
Madison, WI 53706-1559

Dear President Rothman:

I am submitting this letter and associated materials in support of the University of Wisconsin-Eau Claire's (UW-Eau Claire's) proposed Bachelor of Science (B.S.) major in Assistive Systems and Robotics Engineering (128-credit comprehensive major) for review, consideration, and approval by Universities of Wisconsin System Administration and the Universities of Wisconsin System Board of Regents.

The B.S. major in Assistive Systems and Robotics Engineering aligns with UW-Eau Claire's mission to provide "educational opportunities responsive to the needs of our communities, state, region and beyond," and is built upon UW-Eau Claire's current array of programs in Materials Science Engineering, Biomedical Engineering, and Computer Science. This major is supported by Workforce Development funding and aligns with UW-Eau Claire's commitment to produce additional graduates who are prepared to work in high demand engineering fields.

In keeping with parameters outlined in the *Approval to Plan a B.S. in Robotics Engineering*, this program will focus on the development of robotics at the human-machine interface, with applications to assistive systems for use in healthcare and related settings. A skilled workforce, educated in robotics, is required to design and implement expanding technologies in healthcare and assistive systems. Robots are increasingly common in healthcare applications including precision robotic surgery, rehabilitation, telepresence, pharmacy, social assistance, imaging assistance, and interventional assistance.

The program will be delivered in a primarily face-to-face format, although students will have some online course options in the Liberal Education program. The program meets UWEC's definitions and standards for quality. In keeping with parameters outlined in the *Approval to Plan a B.S. in Robotics Engineering*, enrollment in the program will be limited to approximately 80 students, consistent with our Workforce Development commitment to generate approximately 20 engineering graduates per year.

The program has been carefully considered and is supported on campus. The proposed program was approved by University Senate on December 10, 2024, and the University Senate action was signed by Chancellor James Schmidt on December 12, 2024. All programs at the University are subject to an in-depth review every seven years, which is complemented by an annual program data review and reflection process focused on continuous improvement. Assessment of student learning on program outcomes will be conducted each year in keeping with standard UW-Eau Claire practice. Student retention, time-to-graduation, and graduation rates will be monitored as part of the annual program data review process.

After reviewing the proposal, I am confident UW-Eau Claire has identified the financial, capital, and human resources to launch and maintain the program. The resources consist of Workforce Development funding that will be used to hire 2.0 FTE with expertise in robotics in the Department of Physics and Astronomy for Fall 2025. The Workforce Development funding also provides ongoing resources for equipment and supplies to support the program, which will be further supplemented by additional tuition provided by upper-division students enrolled in the engineering major.

Faculty at UW-Eau Claire welcome opportunities for collaborations that can grow from the authorization of this program. UW-Eau Claire has reached out to neighboring Universities of Wisconsin institutions to collaborate by sharing faculty expertise and equipment to support research and student capstone projects. Sharing these resources and leveraging our collective expertise can provide students and faculty with opportunities to work on projects that would not otherwise be possible on their home campuses.

In closing, I enthusiastically support the proposal for the Bachelor of Science major in Assistive Systems and Robotic Engineering and look forward to UW-Eau Claire being authorized to offer this degree.

Thank you for your consideration.

Sincerely,

Michael J. Carney
Interim Provost and Vice Chancellor for Academic Affairs

cc: Johannes Britz, Senior Vice President for Academic and Student Affairs
Tracy Davidson, Associate Vice President for Academic Affairs

Education Committee
April 16, 2025

Item C.3.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION) BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING, UNIVERSITY OF WISCONSIN–GREEN BAY

REQUESTED ACTION

Adoption of Resolution C.3., authorizing the implementation of the Bachelor of Science in Software Engineering at the University of Wisconsin–Green Bay

Resolution C.3. That, upon the recommendation of the Chancellor of the University of Wisconsin–Green Bay and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Bachelor of Science in Software Engineering program at the University of Wisconsin–Green Bay.

SUMMARY

The University of Wisconsin–Green Bay (UW-Green Bay) proposes to establish a Bachelor of Science (B.S.) degree in Software Engineering. This proposed B.S. in Software Engineering is an elevation of an existing Software Engineering emphasis within the B.S. in Computer Science program at UW-Green Bay, which has seen rapid enrollment growth over the last five years. Implementing a standalone major in Software Engineering will respond to student demand, local and regional workforce needs, and the university's mission to provide specialized professional and technical degrees at the baccalaureate level. The B.S. in Software Engineering will require 120 credits and is comprised of general education requirements, supportive coursework to prepare students for courses in the major, and 66 credits in the major, including capstone courses. The program's intensive, application-oriented curriculum provides students with foundational programming skills and specialized expertise in software lifecycle management, user experience design, and emerging technologies. Graduates will be adept in both traditional software engineering expertise and modern AI applications, making them highly competitive in the job market. They will be prepared for positions as software developers or engineers and will be able to apply their training in a wide range of industries such as banking and finance, insurance, and manufacturing. Projected growth for software developers and engineers is anticipated to grow faster than average both in the state of Wisconsin and nationally, with a predicted

18% growth in Wisconsin and 25% growth nationally over the next decade. The program-specific tuition rate for Computer Science will apply for undergraduate students in the B.S. in Software Engineering program.

Presenter

- Dr. Kate Burns, Provost and Vice Chancellor for Academic Affairs

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting (Revised August 2023), available at https://www.wisconsin.edu/uw-policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

REQUEST FOR AUTHORIZATION TO IMPLEMENT A BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING AT UNIVERSITY OF WISCONSIN–GREEN BAY PREPARED BY UW–GREEN BAY

ABSTRACT

The University of Wisconsin–Green Bay (UW-Green Bay) proposes to establish a Bachelor of Science (B.S.) degree in Software Engineering. This proposed B.S. in Software Engineering is an elevation of an existing Software Engineering emphasis within the B.S. in Computer Science program at UW-Green Bay, which has seen rapid enrollment growth over the last five years. Implementing a standalone major in Software Engineering will respond to student demand, local and regional workforce needs, and the university's mission to provide specialized professional and technical degrees at the baccalaureate level. The B.S. in Software Engineering will require 120 credits and is comprised of general education requirements, supportive coursework to prepare students for courses in the major, and 66 credits in the major, including capstone courses. The program's intensive, application-oriented curriculum provides students with foundational programming skills and specialized expertise in software lifecycle management, user experience design, and emerging technologies. Graduates will be adept in both traditional software engineering expertise and modern AI applications, making them highly competitive in the job market. They will be prepared for positions as software developers or engineers and will be able to apply their training in a wide range of industries such as banking and finance, insurance, and manufacturing. Projected growth for software developers and engineers is anticipated to grow faster than average both in the state of Wisconsin and nationally, with a predicted 18% growth in Wisconsin and 25% growth nationally over the next decade. The program-specific tuition rate for Computer Science will apply for undergraduate students in the B.S. in Software Engineering program.

PROGRAM IDENTIFICATION

University Name
University of Wisconsin-Green Bay

Title of Proposed Academic Program
Software Engineering

Degree Designation(s)
Bachelor of Science

Proposed Classification of Instructional Program (CIP) Code
14.0903-Computer Software Engineering

Mode of Delivery
Single Institution; In-person

Department or Functional Equivalent
Richard J. Resch School of Engineering

College, School, or Functional Equivalent
College of Science, Engineering, and Technology

Proposed Date of Authorization
April 2025

Proposed Date of Implementation
August 2025

PROGRAM INFORMATION

Overview of the Program

The software industry is evolving rapidly and requires a workforce with foundational programming skills and specialized knowledge in software lifecycle management, user experience design, and the integration of new technologies integral to software engineering such as Generative AI, Augmented/Virtual Reality, and DevOps, among others. The proposed B.S. in Software Engineering aims to offer an intensive, application-oriented curriculum that provides in-depth knowledge and training in software engineering practices like requirement analysis, system design, software architecture, testing methodologies, and DevOps. This advancement in training is essential to prepare students to meet the specific demands of the evolving software engineering profession, where DevOps plays a crucial role in streamlining the development process, improving collaboration between teams, and ensuring end-to-end software delivery. The B.S. in Software Engineering program aligns with the UW-Green Bay's core mission of providing specialized professional and technical degrees at the baccalaureate level.

The B.S. in Software Engineering will require 120 credits, with 30 credits required to meet the general education requirements, 22 credits in supportive/pre-requisite coursework, 66 credits in the major, and elective credits to reach 120 credits. It should be noted that some program prerequisites and support courses may meet general education requirements. High impact practices will be included in multiple courses within the curriculum, culminating with a 6-credit capstone sequence completed over two semesters.

Projected Enrollments and Graduates by Year Five

Table 1 represents enrollment and graduation projections for students entering the program over the next five years. The projected enrollments for the B.S. in Software Engineering were determined by analyzing trends for the existing Software Engineering emphasis at UW-Green Bay, which has grown significantly over the last five years. The number of new students in Year 1 is consistent with the number of new freshmen that were enrolled in the existing software engineering emphasis in the fall of 2024. The number of continuing students in Year 1 represents an estimate of students from the current software engineering emphasis who are predicted to move to the new major; these students are expected to primarily be students at the freshman and sophomore level. It is anticipated that some of these continuing students may graduate as early as Year 2 of the B.S. in Software Engineering program. Over the first five years of the program, it is expected that a total of 350 new students will have enrolled in the program and 85 students will have graduated. A retention rate of 70% is anticipated, which is consistent with the retention goal established by UW-Green Bay, but slightly higher than the current overall retention rate for the university and the Computer Science major. Retention will be supported through small class sizes, increasing hands-on laboratory experiences, and promoting high impact practices such as internships and work-based learning.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	50	60	70	80	90
Continuing Students	40	63	76	92	103
Total Enrollment	90	123	146	172	193
Graduating Students	0	15	15	25	30

Tuition Structure

For students enrolled in the B.S. in Software Engineering, Computer Science program-specific tuition will apply. Students in this program will be assessed an additional tuition of $30.26 per credit for Computer Science, which will be included in the tuition rate per credit discussed below. For the current academic year, residential program-specific tuition and segregated fees total $4,713.13 per semester for a full-time student enrolled in 12-18 credits per semester. Of this amount, $3,925.57 is attributable to program-specific tuition in Computer Science and $787.56 is attributable to segregated fees. It is anticipated that some resident students in this program will attend part-time. A part-time student will pay $327.14 in program-specific tuition and $65.63 in segregated fees per credit.

Non-resident program-specific tuition and segregated fees for a full-time student total $9,007.02 per semester, with $8,219.46 in program-specific tuition and $787.56 in segregated fees.

Student Learning Outcomes and Program Objectives

The B.S. in Software Engineering program equips students with foundational programming skills and specialized expertise in software lifecycle management, user experience design, and emerging technologies. Graduates will be adept in both traditional software engineering expertise and modern AI applications, making them highly competitive in the job market.

The student learning outcomes for the proposed B.S. in Software Engineering are aligned with ABET (formerly Accreditation Board for Engineering and Technology) criteria and are summarized below:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Program Requirements and Curriculum

The program will be comprised of 120 credits that include 30 general education credits, 22 credits in supporting/pre-requisite coursework, and 66 credits in computer science and software engineering for the major. Students will complete elective courses in any area to meet the graduation requirement of 120 credits. It should be noted that some program prerequisites and/or support courses may meet general education requirements. Table 2 illustrates the program's curriculum, which includes six new courses with the Software Engineering (SE) prefix.

Table 2: B.S. in Software Engineering Program Curriculum

General education courses required for graduation: 30 credits required		
FYS 198	First Year Seminar	3 credits
GEN ED	Creative and Artistic Inquiry	3 credits
GEN ED	Human Culture and Values	3 credits

GEN ED	Human Society and Behavior	3 credits
GEN ED	Global Perspectives	3 credits
GEN ED	Ethnic Studies	3 credits
GEN ED	Scientific Methods and Inquiry	3 credits
GEN ED	Environmental Sustainability	3 credits
GEN ED	Quantitative Reasoning	3 credits
GEN ED	Information Literacy	3 credits
Program prerequisites or support courses: 22 credits required		
ENGR236	Technical Writing	3 credits
MATH202	Calculus and Analytical Geometry I	4 credits
MATH203	Calculus and Analytical Geometry II	4 credits
MATH260	Introductory Statistics	4 credits
MATH320	Linear Algebra and Matrix Theory	4 credits
COMMXXX	Communications Course (3 options)	3 credits
Academic degree program or major course requirements: 66 credits required		
COMPSCI120	Web Programming	3 credits
COMPSCI130	Computer Programming I	3 credits
COMPSCI140	Python Programming	3 credits
COMPSCI171	Technology, Ethics, and Society	3 credits
COMPSCI181	Human-Computer Interactions	3 credits
COMPSCI221	Database Design and Management	3 credits
COMPSCI240	Discrete Mathematics	3 credits
COMPSCI251	Computer Systems Fundamentals	3 credits
COMPSCI330	Computer Programming II	3 credits
COMPSCI348	Computer Networks	3 credits
COMPSCI351	Data Structures	3 credits
COMPSCI353	Computer Architecture and Organization	3 credits
COMPSCI450	Theory of Algorithms	3 credits
COMPSCI452	Operating Systems Using Linux	3 credits
SE310	Software Engineering Fundamentals	3 credits
SE320	Software Tools and Process	3 credits
SE340	Software Requirements and Architecture	3 credits
SE350	Software Quality	3 credits
SE490	Software Engineering Capstone	3 credits
SE490	Software Engineering Capstone	3 credits
COMPSCIXXX	Upper-Level Electives (select two courses)	6 credits
Electives to reach 120 credit graduation requirement		
Total Credits		**120 credits**

Collaborative Nature of the Program

Although this program will be offered entirely by UW-Green Bay, the institution has strong relationships with technical colleges in the region. These relationships have led to

successful collaborations for computer science, engineering, and engineering technology programs, which are all part of the Richard J. Resch School of Engineering. There are also established articulation agreements for students from Fox Valley Technical College and Northeast Wisconsin Technical College who complete an associate degree in Software Developer to transfer to all existing emphases of the B.S. in Computer Science program at UW-Green Bay. These articulations will be adapted to facilitate transfer to the B.S. in Software Engineering program. Additionally, Titletown Tech, which is a partnership between the Green Bay Packers and Microsoft, is focused on creating tech-enabled solutions for key industries in the region and includes UW-Green Bay as a partner.

Projected Time to Degree

Full-time students who apply to the B.S. in Software Engineering program and have adequate preparation will be able to complete the degree in four years, which could be accelerated by taking summer and J-term (January winterim) courses. Students may also choose to complete the program part-time, which would result in a longer timeframe for degree completion.

Accreditation

The B.S. in Software Engineering program will follow the Higher Learning Commission's accreditation guidelines and pursue ABET accreditation, the benchmark for applied science, computing, engineering, and engineering technology programs. It should be noted that UW-Green Bay already has three ABET accredited programs in engineering technology (electrical, mechanical, and environmental), one in mechanical engineering, and is pursuing ABET accreditation for the B.S. in Electrical Engineering program during the 2024-25 academic year.

PROGRAM JUSTIFICATION

Rationale

The B.S. in Software Engineering program aligns with the university's core mission of providing specialized professional and technical degrees at the baccalaureate level. Additionally, Northeastern Wisconsin's economic landscape is increasingly influenced by technology-driven industries requiring sophisticated software solutions. The B.S. in Software Engineering program is strategically designed to supply highly competent software engineers to local and regional sectors, support local businesses and contributing to regional economic development, and increase the visibility of this program to students. The need for a standalone Software Engineering major is further reinforced by student demand for the current software engineering emphasis, which has increased rapidly over the last five years.

Institution and Universities of Wisconsin Program Array

UW-Green Bay currently provides software engineering training under the umbrella of the B.S. in Computer Science program. The proposed B.S. in Software Engineering does not duplicate any other existing programs at UW-Green Bay. Upon implementation of the B.S. in Software Engineering, students will be offered an opportunity to move to the new standalone degree as the existing emphasis is eliminated. Adding the B.S. in Software Engineering will enhance UW-Green Bay's academic offerings by filling a gap in the current engineering program array. This program is aligned with state and national educational priorities in STEM and addresses a clear industry need.

Based on a review of the Universities of Wisconsin dashboard, UW-Platteville offers a B.S. in Software Engineering in the same CIP area (CIP code: 14.0903 – Computer Software Engineering). Four UW universities (UW-La Crosse, UW-Madison, UW-Milwaukee, and UW-Platteville) offer bachelor's degree programs in the curricular area of Computer Engineering (CIP 14.0901). Three UW universities (UW-Green Bay, UW-La Crosse, and UW-Stout) have reported to the Office of Policy Analysis and Research that they offer sub-degree programs in software engineering or software development as part of their computer science programs. It should be noted that discussions with both UW-Platteville and UW-Stout occurred following the approval to plan, which addressed their questions regarding this proposed program at UW-Green Bay. Outside of Wisconsin, Michigan Tech University offers a B.S. in Software Engineering in Computer Science and B.S. in Computer Engineering. Data from fall of 2023 indicated that Michigan Tech had over 500 students in computer science and over 200 students in computer engineering, respectively.

Need as Suggested by Student Demand

Student demand for the B.S. in Software Engineering at UW-Green Bay was projected based on enrollment trends within the existing Software Engineering emphasis within the B.S. in Computer Science program. In the past five years, enrollment in the emphasis has grown from 94 students in the fall semester of 2019-20 to 164 students in the fall semester of 2024-25. Additionally, existing articulations with regional technical colleges highlight additional student demand for this program.

Need as Suggested by Market Demand

This program was developed in consultation with local industry partners, and it focuses on integrating Industry 4.0 and generative AI technology, which are particularly important to the manufacturing economy in northeastern Wisconsin. According to the Wisconsin Department of Workforce Development, there is a projected 31% increase in demand for software developers and engineers from 2022 to 2032.[1] The US Bureau of

[1] Department of Workforce Development. State of Wisconsin. Wisconsin Long Term Occupation Employment Projections 2022-2032- Software Developers. LMI Data Access - WisConomy (Visited on February 26, 2025).

Labor Statistics forecasts a national increase of 17% between 2023 and 2033, with 327,900 new positions at a median salary of $130,160 per year.[2] The curriculum for the B.S. in Software Engineering program aims to equip students with the skills necessary to lead the design, development, and deployment of software systems that utilize generative AI technology. These systems are increasingly prevalent in sectors such as healthcare, finance, supply chain, and manufacturing. The program's goal is to bridge the skills gap by producing graduates who are adept in traditional software engineering and modern AI applications, making them highly sought after in the job market. The establishment of Titletown Tech, a partnership between the Green Bay Packers and Microsoft, is focused on creating tech-enabled solutions for key industries in the region, and it includes UW-Green Bay as a partner. Therefore, it is crucial for UW-Green Bay to be able to meet the demand for software engineering brought about by this organization and its growing partners in the region.

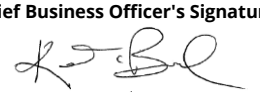
[2] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Software Developers, Quality Assurance Analysts, and Testers: U.S. Bureau of Labor Statistics (bls.gov) (visited February 26, 2025).

University of Wisconsin - Green Bay
Cost and Revenue Projections For the B.S. in Software Engineering

	Items	Projections				
		2025-26 (FY26)	2026-27 (FY27)	2027-28 (FY28)	2028-29 (FY29)	2029-30 (FY30)
		Year 1	Year 2	Year 3	Year 4	Year 5
I	**Enrollment (New Student) Headcount**	50	60	70	80	90
	Enrollment (Continuing Student) Headcount	0	63	76	92	103
	Enrollment (New Student) FTE	45	54	63	72	81
	Enrollment (Continuing Student) FTE	0	57	68	83	93
II	**Total New Credit Hours**	1350	1620	1890	2160	2430
	Existing Credit Hours	0	1710	2040	2490	2790
III	**FTE of New Faculty/Instructional Staff**	2	0	1	0	0
	FTE of Current Fac/IAS	2	5	6	7	7
	FTE of New Admin Staff	0	0	0.5	0	0
	FTE Current Admin Staff	0	0	0	0.5	0.5
IV	**Revenues**					
	Program Specific Tuition-Computer Science	$353,311	$871,501	$1,028,528	$1,216,961	$1,366,137
	Fees	$0	$0	$0	$0	$0
	Program Revenue (Grants)	$0	$0	$0	$0	$0
	Program Revenue - Other	$0	$0	$0	$0	$0
	GPR (re)allocation	$540,740	$696,203	$860,507	$886,322	$912,911
	Total Revenue	**$894,051**	**$1,567,704**	**$1,889,035**	**$2,103,283**	**$2,279,048**
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary	$380,000	$489,250	$705,502	$726,663	$748,461
	Instuctional Academic Staff	$0	$0	$0	$0	$0
	Administrative and Student Support Staff	$0	$0	$50,000	$51,500	$53,045
	Other Staff	$0	$0	$0	$0	$0
	Fringe Faculty and Academic Staff	$160,740	$206,953	$298,427	$307,378	$316,599
	Fringe University Staff	$0	$0	$27,350	$28,171	$29,016
	Fringe Other Staff	$0	$0	$0	$0	$0
	Facilities and Capital Equipment					
	University buildings and space	$ 100,000	$ -	$ -	$ -	$ -
	Capital Equipment	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 175,000
	Operations	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000
	Other Expenses					
	Other (please list)	$15,000	$0	$0	$0	$0
	Other (please list)	$0	$0	$0	$0	$0
	Total Expenses	**$730,740**	**$771,203**	**$1,156,279**	**$1,188,712**	**$1,347,121**
	Net Revenue	**$163,311**	**$796,501**	**$732,755**	**$914,571**	**$931,927**

Provost's Signature: **Date:**

Chief Business Officer's Signature: **Date:**



COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN–GREEN BAY
BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING

PROGRAM INTRODUCTION

The University of Wisconsin-Green Bay (UW-Green Bay) proposes to establish a Bachelor of Science (B.S.) in Software Engineering. This proposed B.S. in Software Engineering is an elevation of an existing Software Engineering emphasis within the B.S. in Computer Science program at UW-Green Bay, which has seen rapid enrollment growth over the last five years. Implementing a standalone major in Software Engineering will respond to student demand, local and regional workforce needs, and the university's mission to provide specialized professional and technical degrees at the baccalaureate level. The program requires 120 credits, consisting of general education, pre-requisite/supporting, and major coursework. The curriculum for the B.S. in Software will include six new courses for the major at the 300/400 level. The proposed B.S. in Software Engineering is supported by Workforce Development funds, which will be used to hire two new faculty members to support the program. Program-specific tuition for Computer Science will apply for this program.

COST REVENUE NARRATIVE

Section I – Enrollment

Enrollment projections were determined by analyzing trends for the existing Software Engineering emphasis within the B.S. in Computer Science program. For Year 1, 50 new students are predicted to enter the program. It is anticipated that 40 students, currently at the freshmen and sophomore level, will move from the existing software engineering emphasis to the new standalone major and, therefore, will be considered as continuing students in subsequent years. The FTE projections are based on current data for the B.S. in Computer Science, where nearly 86% of students are currently enrolled as full-time students. Therefore, the FTE estimates have been estimated at 90% of headcount for both new and continuing students. A retention rate of 70% has also been factored into continuing student enrollment projections.

Section II – Credit Hours

The credits hours in this section follow the enrollment projections for new and continuing students. Credit hours were calculated with an assumption that 15 credits per semester will be completed per student FTE on average. For both new and continuing

students, the FTE are multiplied by 30 credits/year to get the total number of new credit hours and the total number of existing credit hours, respectively.

Section III – Faculty and Staff Appointments

The Computer Science program currently includes 6.5 FTE, with one position shared with the College of Arts, Humanities and Social Sciences (CAHSS). All seven of these positions are tenure-track, with two associate professors and five assistant professors. Faculty deliver courses for the two existing emphases in Computer Science – cybersecurity and software engineering. As shown in Section III (Attachment B worksheet), four of these current positions will be reallocated in Years 1-3 to provide instruction for the new B.S. in Software Engineering program as the existing emphasis is eliminated. Two existing tenure-track faculty positions will be reallocated in Year 1 and are listed as current faculty in the worksheet. Two additional tenure-track positions are currently being searched for this spring as part of the base-funding investment made at UW-Green Bay with the Workforce Development funds that were allocated in FY25. These positions are included in Section III of the worksheet as new faculty and will be starting in Year 1. In both Year 2 and Year 3, one additional tenure-track faculty position will be reallocated to the new B.S. in Software Engineering, bringing the total number of current faculty to six in Year 3. As enrollment in the B.S. in Software Engineering program grows, it is predicted that an additional faculty member will also be needed in Year 3. In addition to faculty, a 0.5 FTE has also been allocated for Year 3, with this position intended to support the computer labs associated with the program as well as the required capstone projects. This position may potentially be shared with IT services at UW-Green Bay, as there may be some software used where additional in-house expertise will be required.

Section IV – Program Revenues

Program revenue will be generated from tuition and fees.

<u>Program-Specific Tuition</u>

Tuition is calculated as total student FTE (based on 12 credit hour load) per year. For students enrolled in the B.S. in Software Engineering, Computer Science program-specific tuition will apply. Students in this program will be assessed an additional tuition of $30.26 per credit for Computer Science, which will be included in the tuition rate per credit discussed below. For the current academic year, residential program-specific tuition and segregated fees total $4,713.13 per semester for a full-time student enrolled in 12-18 credits per semester. Of this amount, $3,925.57 is attributable to program-specific tuition in Computer Science and $787.56 is attributable to segregated fees. It is anticipated that some resident students in this program will attend part-time. A part-time student will pay $327.14 in program-specific tuition and $65.63 in segregated fees per credit. The cost and revenue model presented is conservative, and it anticipates that 100% of the tuition generated will be at the lower resident rate. Please note that since tuition revenue from students in Year 1 is predicted to result from continuing students who shift from the

existing Software Engineering concentration to the standalone major, no tuition revenue from continuing students has been included for Year 1.

Fees

There are no additional fees associated with this program.

Program Revenues and GPR

The GPR reallocation in Section IV for Year 1 is based on two new positions funded by the Workforce Development funds, as well as two positions that will be transitioned from teaching in the existing software engineering emphasis in B.S. in Computer Science to the new Software Engineering major. One additional position will similarly be transitioned in both Year 2 and Year 3 as the Software Engineering major grows and the emphasis is deactivated. The GPR reallocation for Year 1 includes an average salary of $95,000 and a fringe rate of 42.3%, which is applied to the four tenure-track faculty. The GPR reallocation in Year 2 and Year 3 increases as one additional tenure-track faculty position is reallocated to the program each year, while also including 3% annual increases in salary. The new position hired in Year 3 is not considered a reallocation, so faculty salary and fringe expenses for the program in Years 3-5 are higher than the amount of the reallocation.

Section V – Program Expenses

As shown in the table, the majority of the program expenses will be from salaries and fringe benefits for faculty and staff.

Salary and Fringe

Based on the salaries of existing faculty in Computer Science, while also accounting for an increase of 5% for pay plan in 2025, the average salary for tenure-track faculty was estimated at $95,000 in the first year of the program. A 3% annual increase in salaries has been included for Year 2 through Year 5.

For 2025, the faculty composite fringe rate will be 42.3% and the university staff composite fringe rate will be 54.7%, respectively. These fringe rates were held constant for Year 2 through Year 5 in the table, while noting that the overall expense for fringe will increase as salaries increase.

Facilities and Capital Equipment

Given that there is an existing software engineering emphasis, there will be minimal need for facilities and new capital equipment. However, two classrooms will require renovations to make them more suitable for the new upper-level courses in the B.S. in Software Engineering. These renovations will also increase room capacities and the associated course caps to increase the instructional efficiency of the program. Renovation costs have been estimated at $100,000 in Year 1 and are being supported by the Workforce Development funds.

An existing computer laboratory will also be renovated and updated with new furniture and equipment using Workforce Development funds. It should also be noted that new computers for this laboratory will be purchased using Workforce Development funds in FY25, with an expected refresh cycle of 4-5 years and the replacement included in the table as a capital equipment expense of $125,000 in Year 5. There is also a budget allocation of $50,000 annually for other capital equipment and $25,000 annually for software and other miscellaneous supplies.

Other Expenses

The only expense included in this category is for a marketing plan to promote the new B.S. in Software Engineering program. This estimate includes costs for digital marketing, program brochures, and other optional items such as retractable banners.

Section VI – Net Revenue

Projected net revenue balances are shown at the bottom of the budget table and will be available for program development. Although there will be some start-up costs as summarized above, due to the fact that this program is an elevation of an existing emphasis, profitability is expected in 2026 and beyond. Similar to other new programs that have been started in the Richard J. Resch School of Engineering since its formation in 2018, excess revenue or donations from the community may be placed in an endowment to provide long-term support for scholarships, equipment, and faculty support for research.

UNIVERSITY of WISCONSIN
GREEN BAY

Date: February 14, 2025

To: Jay Rothman, UW-System President

Cc: Tracy Davidson, Associate Vice President
Office of Academic Programs & Faculty Advancement

From: Kate Burns, Provost and Vice Chancellor for Academic Affairs
UW-Green Bay

Subject: Authorization to Implement: Bachelor of Science in Software Engineering

I confirm the University of Wisconsin-Green Bay's commitment to adding a Bachelor of Science in Software Engineering to our undergraduate program array. The program received formal support by the Faculty Senate at their meeting on 11 December 2024.

The BS in Software Engineering aims to offer an intensive, practice-oriented curriculum that delves deeply into software engineering practices like requirement analysis, system design, software architecture, testing methodologies, and DevOps. The proposed program aligns with the university's core mission of providing specialized professional and technical degrees at the baccalaureate level.

The program was developed and implemented after consultations with local industry partners and focuses on integrating Industry 4.0 and generative AI technology. The program's goal is to bridge the skills gap by producing graduates who are adept in traditional software engineering and modern AI applications, making them highly sought after in the job market. The establishment of Titletown Tech, a partnership between the Green Bay Packers and Microsoft focused on creating tech-enabled solutions for key industries in the region, includes UW-Green Bay as a partner. This program also aligns with the efforts to increase graduates in engineering fields using the JFC workforce development funds. Therefore, it is crucial for UW-Green Bay to be able to meet the demand for software engineering brought about by this organization and its growing partners in the region.

This program relies on existing resources and the JFC workforce development funds. We have received significant advancement support for engineering, including the endowed Richard J. Resch School of Engineering, to help with additional needs. UW-Green Bay has existing faculty and instructional staff who will deliver coursework and assess student learning and conduct program reviews in this area. They all are qualified per Higher Learning Commission (HLC) and UW System requirements.

The program will follow the Higher Learning Commission's accreditation guidelines and pursue ABET accreditation, the benchmark for applied science, computing, engineering, and engineering technology programs. UW-Green Bay already has three ABET accredited program in engineering technology (electrical, mechanical and environmental), one in mechanical engineering, and is awaiting confirmation of ABET accreditation for electrical engineering, which was pursued during the 2024-25 academic year.

Adding the Bachelor of Science in Software Engineering will enhance UW-Green Bay's academic offerings by filling a significant gap in the current program array. We have seen strong interest in our software engineering emphasis within the computer science major. This emphasis has grown significantly over the past 5 years as well, highlighting the need for a standalone major. This program is aligned with local, state, and national educational priorities in STEM. It addresses a clear industry need, allowing UW-Green Bay to collaborate with businesses to better serve the region.

I am fully supportive of the development of a Bachelor of Science in Software Engineering at UW-Green Bay. Please let me know if you require any additional information regarding the program, and thank you for your consideration. I look forward to bringing this degree program to the Board of Regents for consideration to implement.

Education Committee
April 16, 2025

Item C.4.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION)
MASTER OF SCIENCE IN
PLANT SCIENCE AND TECHNOLOGY
UNIVERSITY OF WISCONSIN–MADISON

REQUESTED ACTION

Adoption of Resolution C.4., authorizing the implementation of the Master of Science in Plant Science and Technology at the University of Wisconsin–Madison.

Resolution C.4. That, upon the recommendation of the Chancellor of the University of Wisconsin–Madison and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Master of Science in Plant Science and Technology program at the University of Wisconsin–Madison.

SUMMARY

The University of Wisconsin (UW)-Madison proposes to establish a Master of Science (M.S.) in Plant Science and Technology. The program will be housed in the Department of Plant and Agroecosystem Sciences in the College of Agricultural and Life Sciences. In 2023, the Departments of Agronomy and Horticulture merged to become the Department of Plant and Agroecosystem Sciences. The newly established department reviewed academic programs and considered updates to curricula to best support the educational and research missions of the new department and to deliver programming that meets the changing needs of students and industry. The proposed M.S. in Plant Science and Technology program will replace the existing separate master's programs in Agronomy and Horticulture with a unified program that will leverage the diverse research interests and expertise of department faculty, encourage collaboration across disciplines, and enhance graduate training. The program requires students to complete 30 credits of coursework that focus on the scientific principles and technology underlying the cultivation of agricultural plants and their utilization for food, feed, fiber, energy, and well-being. Graduates will be prepared for careers in agricultural research, management, and consultation in sectors of private industry, government, and academic institutions. Above average growth is expected in related occupations. Standard graduate tuition will apply.

Presenter

- Dr. Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting, available at https://www.wisconsin.edu/uw–policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

REQUEST FOR AUTHORIZATION TO IMPLEMENT A MASTER OF SCIENCE IN PLANT SCIENCE AND TECHNOLOGY AT THE UNIVERSITY OF WISCONSIN-MADISON PREPARED BY UW-MADISON

ABSTRACT

The University of Wisconsin (UW)-Madison proposes to establish a Master of Science (M.S.) in Plant Science and Technology. The program will be housed in the Department of Plant and Agroecosystem Sciences in the College of Agricultural and Life Sciences. In 2023, the Departments of Agronomy and Horticulture merged to become the Department of Plant and Agroecosystem Sciences. The newly established department reviewed academic programs and considered updates to curricula to best support the educational and research missions of the new department and to deliver programming that meets the changing needs of students and industry. The proposed M.S. in Plant Science and Technology program will replace the existing separate master's programs in Agronomy and Horticulture with a unified program that will leverage the diverse research interests and expertise of department faculty, encourage collaboration across disciplines, and enhance graduate training. The program requires students to complete 30 credits of coursework that focus on the scientific principles and technology underlying the cultivation of agricultural plants and their utilization for food, feed, fiber, energy, and well-being. Graduates will be prepared for careers in agricultural research, management, and consultation in sectors of private industry, government, and academic institutions. Above average growth is expected in related occupations. Standard graduate tuition will apply.

PROGRAM IDENTIFICATION

University Name
University of Wisconsin-Madison

Title of Proposed Academic Program
Plant Science and Technology

Degree Designation(s)
Master of Science (MS)

Proposed Classification of Instructional Program (CIP) Code
01.1101 Plant Sciences, General

Mode of Delivery
Single university with in-person delivery

Department or Functional Equivalent
Department of Plant and Agroecosystem Sciences

College, School, or Functional Equivalent
College of Agricultural and Life Sciences

Proposed Date of Implementation
Fall 2025

PROGRAM INFORMATION

Overview of the Program

The proposed M.S. in Plant Science and Technology comprises 30 credits of coursework that focus on the scientific principles and technology underlying the cultivation of agricultural plants and their utilization for food, feed, fiber, energy, and well-being. Graduates will be prepared for careers in agricultural research, management, and consultation in sectors of private industry, government, and academic institutions. Courses must be agreed upon by the student's graduate committee members and approved by the Director of Graduate Studies. The overall graduate grade point average requirement is 3.00. Full-time students will enroll in at least 8 credits during the fall and spring semesters to maintain full-time status.

Core coursework will provide a common experience for students and create a foundation for their individualized educational and research goals. Core requirements include advanced statistical methods courses and a graduate seminar in which students will discuss current research and present their research. New coursework in the physiology of plant production will ensure all students in the program acquire critical training in the application of the principles of plant physiology in agricultural systems. Department faculty members with diverse research interests will guide the students in their academic and research experiences that help them achieve their academic and professional goals. All students will prepare and deposit a thesis based on their original research.

Projected Enrollments and Graduates by Year Five

Combined admissions and enrollment data for the M.S. in Horticulture and M.S. in Agronomy prepared by the UW-Madison Graduate School Office of Academic Analysis, Planning & Assessment[1] shows that from fall 2019 to fall 2023, combined enrollment in the

[1] UW-Madison Graduate School; *Graduate School Explorer: Admissions, Enrollment & Funding*; Master's in Biological Sciences.

two programs averaged approximately nine students. Table 1 represents enrollment and graduation projections for students entering the M.S. in Plant Science and Technology over the next five years. Approximately half of the students currently enrolled in the M.S. in Horticulture and M.S. in Agronomy programs have indicated they intend to change their program of study to the proposed M.S. in Plant Science and Technology once it is implemented. These students are reflected as continuing students in Year 1. Enrollment is anticipated to reach approximately 13 students by Year 5 and remain steady at 13 to 15 students thereafter. By the end of Year 5, it is estimated that 25 students will have enrolled in the program, and 14 students will have graduated. Overall retention across the program's first five years is anticipated to be 84 percent; four students will leave the program without graduating. These estimates are based on departmental degree completion data and trends for the existing M.S. in Horticulture and M.S. in Agronomy programs.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	0	2	6	6	6
Continuing Students	5	5	4	6	7
Total Enrollment	5	7	10	12	13
Graduating Students	0	2	3	4	5

Tuition Structure

Standard tuition and fee rates will apply for students enrolled in the M.S. in Plant Science and Technology program. For the academic year 2024-25, full-time graduate tuition and segregated fees for students enrolled in 8 or more credits total $12,324.14 for Wisconsin residents and $25,651.02 for non-residents and international students. Of these totals, $798.31 per semester is attributable to segregated fees. There are no additional program or course fees associated with the proposed program. Some students will receive funding support from research assistantships.

Student Learning Outcomes and Program Objectives

The proposed M.S. in Plant Science and Technology has the following program learning outcomes:

1. Understand essential characteristics of plant agricultural systems.
2. Apply principles of plant physiology in the context of agricultural systems.
3. Communicate scientific ideas and results with clarity in written and oral formats.
4. Discuss the potential impacts of their research on human society and the environment.
5. Conduct research with scientific integrity in the field of plant science and technology.

Program Requirements and Curriculum

The admission requirements for the M.S. in Plant Science and Technology will meet requirements set by UW-Madison Graduate School policies. Applicants are required to hold a bachelor's degree from an accredited U.S. institution or a comparable degree from an international institution. Applicants must also provide three letters of recommendation, a transcript, a resume, and a statement of purpose. International applicants whose first language is not English or whose undergraduate instruction was not in English must submit a Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score.

Table 2: Master of Science in Plant Science and Technology Program Curriculum

Academic degree program or major course requirements:	
Plant Science and Technology Foundation	**3 credits**
PLANTSCI 720: Physiology of Plant Production	3 credits
Plant Science and Technology Breadth	**At least 6 credits**
PLANTSCI 310: Plant Science & Technology in Cropping Systems	4 credits
PLANTSCI 367: Introduction to Organic Agriculture	3 credits
PLANTSCI 532: Environmental Biophysics	3 credits
AGROECOL 370: Grassland Ecology	3 credits
AGROECOL 377: Global Food Production & Health	3 credits
AGROECOL 724: Agroecosystems and Global Change	3 credits
Statistics Requirement	**8 credits**
STAT 571: Statistical Methods for Bioscience I	4 credits
One of the following:	
STAT 572: Statistical Methods for Bioscience II, or	4 credits
AN SCI 865: Design & Analysis of Biological Studies	4 credits
Seminar requirement	**1 credit**
PLANTSCI 920: Seminar in Plant Science and Technology	1 credit
Research Requirement	**At least 6 credits**
PLANTSCI 990: Research	1-12 credits
Additional Coursework	**At least 6 credits**
Total Credits	**30 credits**

Table 2 includes the program curriculum for this program. Students must complete 30 credits of coursework. The program will align with UW-Madison Graduate School policy governing graduate programs, including policies governing student grievances and monitoring timely student progress to degree. The Graduate Program Coordinator will advise students, and the Director of Graduate Studies will provide program direction and support. A faculty mentor will be assigned to each student, and students will be required to meet regularly with their mentor to ensure progress to degree and discuss course selection and academic and professional interests. Department faculty members with diverse research interests will guide the students in their academic and research experiences that

help them achieve their academic and professional goals. All students will prepare and deposit a thesis based on their original research.

Projected Time to Degree

Full-time students who are continuously enrolled may complete program requirements in two years.

Accreditation

This degree does not have any specialized accreditation requirements. No additional approvals are required from the Higher Learning Commission, and the program will be reported according to HLC notice requirements.

PROGRAM JUSTIFICATION

Rationale

In 2023, the Departments of Agronomy and Horticulture merged to become the Department of Plant and Agroecosystem Sciences. To best support the educational and research missions of the new department, the existing separate master's programs in Agronomy and Horticulture are proposed to be replaced by a unified M.S. in Plant Science and Technology. The separate programs have been low-award-producing for several years, and their merger will help provide the critical mass needed to avoid this designation in the future. The proposed M.S. in Plant Science and Technology will provide a more unified education in plant science that incorporates aspects of agronomy and horticulture. This structure is expected to be more attractive to students and employers, better reflect the state of the field, and more accurately represent the department faculty expertise. Increased enrollment projections will be supported by additional tenure-track faculty who recently joined the department, thus increasing departmental capacity to offer more courses. These faculty have expertise in plant science and technology areas such as plant physiology, weed science, corn production, and plant science for dairy sustainability. The expertise of all faculty will position the Department of Plant and Agroecosystem Sciences to train plant scientists skilled in the application of new technologies for precision agriculture, such as remote sensing and artificial intelligence.

Plant Science and Technology focuses on the scientific principles and technology underlying the cultivation of agricultural plants and their utilization for food, feed, fiber, energy, and well-being. The program will be aligned with many components of the College of Agricultural and Life Science's Strategic Plan, including the development of bioenergy crops, sustainable food systems that are accessible and nutritious, and healthy ecosystems. A key element of the UW-Madison strategic plan is "Living the Wisconsin Idea," which involves applying research, education, and practice-based knowledge to foster learning and support innovation and prosperity throughout Wisconsin. Most faculty in the program will have joint appointments with the Division of Extension and, therefore, their graduate

students will be major contributors to this part of the UW-Madison mission, working directly with agricultural professionals to solve practical problems. UW–Madison's strategic framework also seeks to grow the university's research excellence and ensure the continued vitality, competitiveness, and strength of its graduate and professional programs. The M.S. in Plant Science and Technology supports the university in achieving these goals in several ways. The reorganization and refocusing of faculty to this cohesive program supports an integrated perspective on agricultural plant cultivation and use, which is forward-thinking and will make the department more competitive. The composition of the faculty enhances the research output of the Department of Plant and Agroecosystem Sciences. Graduate students will support this research and, in the process, gain valuable skills for future careers and receive funding to help offset the cost of the degree. Finally, an updated curriculum will be more aligned with the needs of employers and students, which will help make the program a competitive and attractive option for top graduate students.

Institution and Universities of Wisconsin Program Array

The new program is not expected to adversely affect other graduate programs at UW-Madison or within the Universities of Wisconsin. Following the approval of the new degree program, the department plans to suspend and discontinue the M.S. in Agronomy and M.S. in Horticulture programs, and there are no equivalent master's programs in the Universities of Wisconsin.

The M.S. in Botany at UW-Madison attracts students with different research interests. In the Classification of Instructional Program (CIP) structure, it is classified as a biological rather than agricultural science program. Students in the M.S. in Plant Science and Technology are likely to have a greater interest in the intersection of plant biology and food production than those in the M.S. in Botany.

There is some overlap with the existing M.S. in Agroecology program at UW-Madison, just as there has been with the M.S. in Horticulture and M.S. in Agronomy programs, but the programs cater to students with different interests. The core curriculum of the agroecology program involves four courses with an emphasis on ecology and sociology, whereas the M.S. in Plant Science and Technology will emphasize applied plant physiology and new technologies (e.g., artificial intelligence and Geographic Information Systems) for nutrient and pest management.

Other programs at UW-Madison that may be considered related are the M.S. in Plant Pathology and the M.S. in Plant Breeding and Plant Genetics. The M.S. in Plant Pathology focuses on the biology of plant pathogens and the effects and control of plant disease, whereas the proposed M.S. in Plant Science and Technology has a broader focus on agricultural systems and the biological processes that impact plant growth and production. The proposed program is also designed to be distinct from the M.S. in Plant

Breeding and Plant Genetics and does not incorporate focused training in this area of study.

There are no similar graduate programs in the Universities of Wisconsin. The M.S. in Plant Science and Technology would complement undergraduate programs at three UW universities, namely:

- UW-Madison: B.S. in Plant Science and Technology
- UW-Platteville: B.S. in Soil and Crop Science, B.S. in Environmental Horticulture
- UW-River Falls: B.S. in Crop and Soil Science, B.S. in Horticulture

Need as Suggested by Student Demand

A limited survey of students in the College of Agricultural and Life Sciences was conducted in February 2024. Of the 86 respondents, 32 indicated they were interested or very interested in a graduate program in plant science and technology.

Data from the National Center for Education Statistics[2] were used to estimate student demand for plant science degrees. For U.S. land-grant institutions in 2022, 402 master's degrees were awarded for CIP codes 01.1101 Plant Sciences, General; 01.1102 Agronomy and Crop Science; 01.1103 Horticultural Science; and 01.1199 Plant Sciences, Other. This figure includes the UW-Madison programs in agronomy and horticulture (five degrees total). The institution with the largest number of degrees across these four CIP codes was the University of Florida, with 43 degrees awarded in total.

These numbers indicate an increased opportunity to grow the number of plant science graduate degrees awarded by UW-Madison. The program redesign, faculty capacity, and the potential to support research assistantships will support increased enrollments, thereby expanding the department's ability to recruit and retain graduate students.

Need as Suggested by Market Demand

The M.S. in Plant Science and Technology program will prepare students for agricultural research, management, and consultation careers. The current master's programs in agronomy and horticulture, which this new program will replace, have graduates that go on to careers in government with agricultural or environmental agencies, agribusiness, and academic institutions. Positions include nutrient and pest management specialists, consultants, soil conservationists, and research specialists. The new program is expected to continue to satisfy that demand and enable graduates to pursue jobs that require more intensive use of agricultural and geospatial data.

[2] National Center for Education Statistics, *Integrated Postsecondary Education Data System (IPEDS)*, https://nces.ed.gov/ipeds/. Accessed Mar. 2, 2025.

In the Occupational Outlook Handbook[3] produced by the U.S. Bureau of Labor Statistics (BLS), plant scientists appear in the occupational category of Agricultural and Food Scientists. This survey does not distinguish between entry-level jobs and those requiring a graduate degree. Still, the total number of jobs in 2022 was 35,400, with a higher-than-average projected growth of 6 percent over the decade 2023-2033. The 2022 median pay was $79,940 per year. The top industries for agricultural and food scientists were research and development in the physical, engineering, and life sciences; food manufacturing; government; and colleges, universities, and professional schools. Occupational projections also indicate that the number of Natural Science Managers positions is expected to rise by 7,500, or 8 percent, over the same decade.

When the Department of Plant and Agroecosystem Sciences surveyed potential employers in early 2024, 9 out of the 16 respondents indicated they had opportunities for graduates with a master's degree in plant science and technology. The primary determinant of whether there were opportunities for master's graduates was if the organization conducted research. The hands-on research experience M.S. in Plant Science and Technology students will gain through the program will prepare them for these jobs after graduating. As noted by the department's survey and the BLS statistics, these jobs are in demand.

[3] U.S. Bureau of Labor Statistics, *Occupational Outlook Handbook*, Agricultural and Food Scientists, https://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm (accessed Mar. 2, 2025).

University of Wisconsin-Madison
Cost and Revenue Projections For MS-Plant Science and Technology

	Items	Projections				
		2025-26	2026-27	2027-28	2028-29	2029-30
		Year 1	Year 2	Year 3	Year 4	Year 5
I	**Enrollment (New Student) Headcount**	0	2	6	6	6
	Enrollment (Continuing Student) Headcount	5	5	4	6	7
	Enrollment (New Student) FTE	0	2	6	6	6
	Enrollment (Continuing Student) FTE	5	5	4	6	7
II	**Total New Credit Hours**					
	Existing Credit Hours	80	112	160	192	208
III	**FTE of New Faculty/Instructional Staff**					
	FTE of Current Fac/IAS	2	2	3	3	3
	FTE of New Admin Staff					
	FTE Current Admin Staff	1	1	1	1	1
IV	**Revenues**					
	Tuition and Seg Fees (based on $670.47/credit)	$ 53,637.60	$ 75,092.64	$ 107,275.20	$ 128,730.24	$ 139,457.76
	Program Revenue (grant funding for assistantships)	$100,000	$100,000	$200,000	$200,000	$200,000
	Tuition Remission Surcharge (for assistanships from grants)	$19,800	$19,800	$15,840	$23,760	$27,720
	Program Revenue - Other					
	GPR (re)allocation	$258,647	$244,563	$267,368	$274,200	$283,229
	Total Revenue	**$432,085**	**$439,456**	**$590,483**	**$626,690**	**$650,407**
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary	$220,000	$224,400	$343,332	$350,199	$357,203
	Instuctional Academic Staff					
	Administrative and Student Support Staff	$50,000	$51,000	$52,020	$53,060	$54,122
	Fringe Faculty and Academic Staff (36.5%)	$98,550	$100,521	$144,303	$147,190	$150,133
	Assistanships (from grants)	$43,735	$43,735	$34,988	$52,482	$61,229
	Facilities and Capital Equipment					
	University buildings and space					
	Capital Equipment					
	Operations					
	Other Expenses					
	Other (tuition remission for assistantships)	$19,800	$19,800	$15,840	$23,760	$27,720
	Other (please list)					
	Total Expenses	**$432,085**	**$439,456**	**$590,483**	**$626,690**	**$650,406**
	Net Revenue	**$0**	**$0**	**$0**	**$0**	**$0**

Provost's Signature: **Date:** 1/16/25

Chief Business Officer's Signature: **Date:** 1/5/25

COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN-MADISON
MASTER OF SCIENCE IN PLANT SCIENCE AND TECHNOLOGY

PROGRAM INTRODUCTION

The proposed Master of Science in Plant Science and Technology is a 30-credit face-to-face master's program. The Department of Plant and Agroecosystem Sciences proposes merging two existing master's programs, the M.S. in Agronomy and the M.S. in Horticulture, to become the new M.S. in Plant Science and Technology. The formerly separate Departments of Agronomy and Horticulture merged into one department in 2023, and this proposal is consistent with the merger of the departments.

COST REVENUE NARRATIVE

Section I – Enrollment

The program expects the M.S. in Plant Science and Technology will start with an initial enrollment of five students in Year 1. These represent students who decide to transition from either the M.S. in Agronomy or M.S. in Horticulture into the new program. Enrollment is expected to reach 13 students by Year 5. By the end of Year 5, it is estimated that 25 students will have enrolled in the program, and 14 students will have graduated from the program. Overall retention across the program's first five years is anticipated to be 84 percent; four students will leave the program without graduating. These estimates are based on departmental degree completion data and trends for the existing M.S. in Horticulture and M.S. in Agronomy programs. The expected time to complete the degree is two years. Students will enroll full-time so that student FTEs will match the student headcounts.

Section II – Credit Hours

The M.S. in Plant Science and Technology program requires 30 credits; however, given the credit-taking history of current graduate students in Horticulture and Agronomy, students commonly enroll in 16 credits in the first year and 16 credits in the second year. These assumptions are the basis for credit calculations. Student credit hours are projected to be 80 in Year 1 and 208 by Year 5.

Section III – Faculty and Staff Appointments

Two FTEs of continuing faculty positions will support this program, and one current administrative staff member, FTE, will also support it. Initially, no new faculty or staff will be hired to support this program, as individuals supporting the two distinct master's programs will transition to support the combined program. The budget spreadsheet shows a relatively small year-to-year increase in faculty and staff FTE dedicated to the program as enrollments and credit hours grow.

Section IV – Program Revenues

Students in the proposed M.S. in Plant Science and Technology will pay standard graduate tuition and segregated fees. The costs and revenues of the proposed program will be managed as part of the UW–Madison instructional/tuition pool (i.e., Fund 101). Tuition revenues will be allocated from the pool to the College of Agricultural and Life Sciences to support the faculty and staff for instructional, advising, and administration within the regular budget allocation process.

Tuition

Standard tuition and fee rates will apply for students enrolled in the M.S. in Plant Science and Technology. For graduate students, the 2024-25 academic year tuition rates for WI residents enrolled as full-time students are $5,363.76 per semester ($670.47 per credit) and $12,027.20 per semester ($1,503.40) for non-residents. Using the Wisconsin resident per credit tuition rate, the annual tuition revenue is projected to be approximately $53,638 in Year 1 and $139,458 by Year 5.

Fees

There are no course or program fees.

Program Revenues and GPR

At UW–Madison, tuition revenues are pooled with state GPR funds and certain other revenues (e.g., indirect costs, ancillary revenues) at the institution level. Funds are then apportioned to each school/college. The College of Agriculture and Life Sciences funds may be used and reallocated to fund program delivery. The Department of Plant and Agroecosystem Sciences makes a conscious effort each admissions cycle to balance admission offers and anticipated acceptance rates with the ability to fund each student through research and project assistantships. Research and project assistantships are primarily funded with faculty grant money, and teaching assistantships are funded by department revenue from undergraduate teaching and GPR dollars from the college.

Grants/Extramural Funding

Extramural funding to faculty research programs will be used to support graduate students in assistantships and is treated here as revenue to support the program. The budget model shows that approximately one-third of students will be granted assistantships. Grant funding is also the source for the tuition remission surcharge of $12,000 per assistantship, partially covering the tuition remission received by students with assistantships.

Section V – Program Expenses

The university will not incur new costs associated with this program, as resources supporting the two distinct master's programs will transition to support the combined program.

Salary and Fringe

The proposed M.S. in Plant Science and Technology will be staffed by existing program faculty and staff. The current related salary expenses are two faculty FTEs, averaging $110,000 per year, and one FTE of administrative staff at $50,000 per year. Salary projections apply a 2 percent inflationary rate. A fringe rate of 36.50 percent for faculty and academic staff is utilized and incorporated into the expenses illustrated in this section. Assistants will be funded from grants, and that scenario is shown based on the assistantship rate of $26,506 per academic year.

Facilities and Capital Equipment

The program will use existing facilities for instruction in the Department of Plant and Agroecosystem Sciences, which are operated and maintained through the department's budget. No additional expenses, facilities, or capital equipment are required for the program.

Other Expenses

Other expenses include tuition remissions for graduate students in Teaching Assistantship, Project Assistantship, or Research Assistantship positions. Supplies, marketing, program materials, and university service charges are expected to remain at the program's current level beyond the initial year.

Section VI – Net Revenue

The M.S. in Plant Science and Technology is a traditional pooled tuition program and will be revenue-neutral. Tuition revenues from students in this program will be pooled at the institution level and used to support student instruction and service. This program is also funded by reallocating staff and faculty resources from the existing M.S. in Horticulture and M.S. in Agronomy programs. Graduate students have funding support via assistantships through faculty grant money and department GPR dollars.

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

Date: 17 January 2025

To: Jay O. Rothman, President, Universities of Wisconsin

CC: Johannes Britz, Interim Senior Vice President for Academic and Student Affairs
Tracy Davidson, Associate Vice President for Academic Affairs
Diane Treis, Director of Academic Programs and Student Learning Assessment

From: Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

Subject: Request for Authorization to Implement: MS-Plant Science and Technology

Submitted Via Email Only to: oaa@wisconsin.edu

In keeping with UW System and Board of Regents policy, I am sending you a Request for Authorization to Implement a new MS-Plant Science and Technology program at the University of Wisconsin–Madison.

The program is designed to meet UW–Madison's definition and standards of quality and will make a meaningful contribution to the university's mission, overall academic plan, and academic degree program array. There is university-wide support for the program, and all relevant and required governance bodies have completed their review processes. In addition, the necessary financial, capital, and human resources are in place and/or have been committed to implement and sustain the program. I thus send the proposal forward with broad university-wide support, governance approval, and my endorsement.

Contingent upon Board of Regents approval, the faculty plan to implement the new program in summer 2025 with first enrollments in the fall of 2025. We are requesting that this proposal be scheduled for consideration at the April 2025 Board of Regents meeting. Please contact Karen Mittelstadt (mittelstadt@wisc.edu) with any questions about these materials.

Attachments: Request for Authorization to Implement (Parts A and B), Cost and Revenue Projections, Cost and Revenue Projections Narrative

Copies:
Jennifer L. Mnookin, Chancellor, UW–Madison
Glenda Gillaspy, Dean and Director, College of Agricultural and Life Sciences
Jeri Barak, Associate Dean for Academic Affairs, CALS
Megan Ackerman-Yost, Assistant Dean for Academic Programs and Policies, CALS
William Karpus, Dean, Graduate School
Jenna Alsteen, Assistant Dean, Graduate School
Rob Cramer, Vice Chancellor for Finance and Administration
David Murphy, Associate Vice Chancellor for Finance and Administration
Allison La Tarte, Vice Provost, Data, Academic Planning & Institutional Research
Karen Mittelstadt, Institutional Academic Planner, Data, Academic Planning & Institutional Research

Office of the Provost and Vice Chancellor for Academic Affairs
150 Bascom Hall University of Wisconsin-Madison 500 Lincoln Drive Madison, Wisconsin 53706
608/262-1304 Fax: 608/265-3324 E-mail: provost@provost.wisc.edu www.provost.wisc.edu

Education Committee
April 16, 2025

Item C.5.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION)
DOCTOR OF PHILOSOPHY IN
PLANT SCIENCE AND TECHNOLOGY
UNIVERSITY OF WISCONSIN–MADISON

REQUESTED ACTION

Adoption of Resolution C.5., authorizing the implementation of the Doctor of Philosophy in Plant Science and Technology at the University of Wisconsin–Madison.

Resolution C.5. That, upon the recommendation of the Chancellor of the University of Wisconsin–Madison and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Doctor of Philosophy in Plant Science and Technology program at the University of Wisconsin–Madison.

SUMMARY

The University of Wisconsin (UW)-Madison proposes to establish a Doctor of Philosophy (Ph.D.) in Plant Science and Technology. The program will be housed in the Department of Plant and Agroecosystem Sciences in the College of Agricultural and Life Sciences. In 2023, the Departments of Agronomy and Horticulture merged to become the Department of Plant and Agroecosystem Sciences. The newly established department reviewed academic programs and considered updates to curricula to best support the educational and research missions of the new department and to deliver programming that meets the changing needs of students and industry. The proposed Ph.D. in Plant Science and Technology will replace the separate doctoral programs in Agronomy and Horticulture with a unified program. The program will focus on the scientific principles and technology underlying the cultivation of agricultural plants and their utilization for food, feed, fiber, energy, and well-being.

This forward-looking 51-credit Ph.D. program will leverage the department faculty's diverse research interests and expertise and encourage collaboration to enhance graduate training. The program will capitalize on the varied research conducted by faculty to provide personalized pathways for students to explore their individual interests while providing a common learning experience through a set of required courses that provide essential

training in applied plant physiology and statistical methods. Graduates will be prepared for careers in academia, the agricultural sector, and government agencies. An intentional emphasis on technology and interdisciplinarity within plant science subfields such as agronomy, crop production, horticulture, pest management, and weed science will prepare graduates for a broad range of careers and research opportunities. Above-average growth is expected in related occupations. Standard graduate tuition will apply.

Presenter

- Dr. Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting, available at https://www.wisconsin.edu/uw–policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

REQUEST FOR AUTHORIZATION TO IMPLEMENT A DOCTOR OF PHILOSOPHY IN PLANT SCIENCE AND TECHNOLOGY AT THE UNIVERSITY OF WISCONSIN-MADISON PREPARED BY UW-MADISON

ABSTRACT

The University of Wisconsin (UW)-Madison proposes to establish a Doctor of Philosophy (Ph.D.) in Plant Science and Technology. The program will be housed in the Department of Plant and Agroecosystem Sciences in the College of Agricultural and Life Sciences. In 2023, the Departments of Agronomy and Horticulture merged to become the Department of Plant and Agroecosystem Sciences. The newly established department reviewed academic programs and considered updates to curricula to best support the educational and research missions of the new department and to deliver programming that meets the changing needs of students and industry. The proposed Ph.D. in Plant Science and Technology will replace the separate doctoral programs in Agronomy and Horticulture with a unified program. The program will focus on the scientific principles and technology underlying the cultivation of agricultural plants and their utilization for food, feed, fiber, energy, and well-being.

This forward-looking 51-credit Ph.D. program will leverage the department faculty's diverse research interests and expertise and encourage collaboration to enhance graduate training. The program will capitalize on the varied research conducted by faculty to provide personalized pathways for students to explore their individual interests while providing a common learning experience through a set of required courses that provide essential training in applied plant physiology and statistical methods. Graduates will be prepared for careers in academia, the agricultural sector, and government agencies. An intentional emphasis on technology and interdisciplinarity within plant science subfields such as agronomy, crop production, horticulture, pest management, and weed science will prepare graduates for a broad range of careers and research opportunities. Above-average growth is expected in related occupations. Standard graduate tuition will apply.

PROGRAM IDENTIFICATION

University Name
University of Wisconsin-Madison

Title of Proposed Academic Program
Plant Science and Technology

Degree Designation(s)
Doctor of Philosophy

Proposed Classification of Instructional Program (CIP) Code
01.1101 Plant Sciences, General

Mode of Delivery
Single university with in-person delivery

Department or Functional Equivalent
Department of Plant and Agroecosystem Sciences

College, School, or Functional Equivalent
College of Agricultural and Life Sciences

Proposed Date of Implementation
Fall 2025

PROGRAM INFORMATION

Overview of the Program

The Ph.D. in Plant Science and Technology comprises 51 credits, which will be completed through coursework and independent research credits. Each student in the program will conduct independent research and write a dissertation. The program will have a process to qualify students as dissertators and approve their dissertations and defense. The program will have a shared set of core coursework to provide a common experience for students and create a foundation for their individualized educational and research goals. This includes advanced statistical methods courses and a graduate seminar in which students will discuss current and peer research and present their research. The department will design a new course in the physiology of plant production to ensure all students in the program acquire critical training in the application of the principles of plant physiology in agricultural systems. A portion of the core curriculum will be shared with the M.S. in Plant Science in Technology. This will increase departmental capacity to support enrollment growth in the Ph.D. program. Department faculty members with diverse research interests will guide Ph.D. students to tailor academic and research programs that advance student career and research goals.

Projected Enrollments and Graduates by Year Five

Combined admissions and enrollment data of the Ph.D. in Horticulture and Ph.D. in Agronomy prepared by the UW-Madison Graduate School Office of Academic Analysis, Planning & Assessment shows that from fall 2019 to fall 2023, combined enrollment in

these programs averaged approximately 14 students annually. Based on conversations with existing students, approximately half are expected to switch to the new Ph.D. in Plant Science and Technology.

Table 1 represents enrollment and graduation projections for students entering the Ph.D. in Plant Science and Technology over the next five years. Students currently enrolled in the Ph.D. in Horticulture and Ph.D. in Agronomy programs who have indicated they plan to change their program of study to the proposed program are reflected as continuing students in Year 1. Over the first five years of the program, it is expected that 24 students will enroll in the program and four students will graduate. Annually, enrollment is expected to reach approximately 16 students by Year 5 and hold steady thereafter. Based on historical data for the Ph.D. in Horticulture and Ph.D. in Agronomy, three students are anticipated to leave the program over five years without completing the degree. Thus, over the program's first five years, retention and completion are anticipated to be 85 percent.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	0	5	5	5	5
Continuing Students	4	4	8	11	11
Total Enrollment	4	9	13	16	16
Graduating Students	0	0	0	2	2

Tuition Structure

Standard tuition and fee rates will apply for students enrolled in the Ph.D. in Plant Science and Technology program. For the academic year 2024-25, full-time graduate tuition and segregated fees for students enrolled in 8 or more credits total $12,324.14 for Wisconsin residents and $25,651.02 for non-residents and international students. Of these totals, $798.31 per semester is attributable to segregated fees. Students who have completed all but the dissertation requirements pay a continuous registration fee of $470.47 for residents and $670.47 for non-residents. Some students will receive funding support from research assistantships.

Student Learning Outcomes and Program Objectives

The proposed Ph.D. in Plant Science and Technology has the following program learning outcomes:

1. Understand essential characteristics of plant agricultural systems.
2. Apply principles of plant physiology in the context of agricultural systems.
3. Communicate scientific ideas and results with clarity in written and oral formats.
4. Discuss the potential impacts of their research on human society and the environment.
5. Conduct research with scientific integrity and independence that advances the field of plant science and technology.

Program Requirements and Curriculum

The Ph.D. in Plant Science and Technology admission requirements will meet requirements set by UW-Madison Graduate School policies. Applicants must hold a bachelor's degree from an accredited U.S. institution of higher education or a comparable degree from an international institution. Applicants must also provide three letters of recommendation, a transcript, a resume, and a statement of purpose. International students whose first language is not English or whose undergraduate instruction was not in English must submit a Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score.

Table 2: Doctor of Philosophy in Plant Science and Technology Program Curriculum

Academic degree program or major course requirements:	
Plant Science and Technology Foundation	**3 credits**
PLANTSCI 720: Physiology of Plant Production	3 credits
Plant Science and Technology Breadth	**At least 6 credits**
PLANTSCI 310: Plant Science & Technology in Cropping Systems	4 credits
PLANTSCI 367: Introduction to Organic Agriculture	3 credits
PLANTSCI 532: Environmental Biophysics	3 credits
AGROECOL 370: Grassland Ecology	3 credits
AGROECOL 377: Global Food Production & Health	3 credits
AGROECOL 724: Agroecosystems and Global Change	3 credits
Statistics Requirement	**8 credits**
STAT 571: Statistical Methods for Bioscience I	4 credits
One of the following:	
STAT 572: Statistical Methods for Bioscience II, or	4 credits
AN SCI 865: Design & Analysis of Biological Studies	4 credits
Seminar requirement	**3 credits**
PLANTSCI 920: Seminar in Plant Science and Technology	1 credit
Research Requirement	**At least 8 credits**
PLANTSCI 990: Research	1-12 credits
Graduate School Breadth (doctoral minor)	**9 credits**
Additional Coursework	**At least 14 credits**
Total Credits	**51 credits**

Table 2 includes the curriculum for this program. Students must complete 51 credits of coursework. The program will align with UW-Madison Graduate School policy governing graduate programs, including policies governing student grievances and monitoring timely student progress to degree. The Graduate Program Coordinator will advise students, and the Director of Graduate Studies will provide program direction and support. A faculty mentor will be assigned to each student, and students will be required to meet regularly with their mentor to ensure progress to degree and to discuss course selection and academic and professional interests. Students must successfully complete a written and an

oral preliminary examination. The student must present an exit seminar on their dissertation research and subsequently defend the thesis orally during a final examination. A deposit of the doctoral dissertation to the Graduate School is required.

Projected Time to Degree

The typical time to degree for this program is approximately five years, depending on the qualifications or credentials earned by the student at the time of admission.

Accreditation

This degree does not have any specialized accreditation requirements. No additional approvals are required from the Higher Learning Commission and the program will be reported according to HLC notice requirements.

PROGRAM JUSTIFICATION

Rationale

In 2023, the Departments of Agronomy and Horticulture merged to become the Department of Plant and Agroecosystem Sciences. To best support the educational and research missions of the new department, the existing separate doctoral programs in Agronomy and Horticulture are proposed to be replaced by a unified Ph.D. in Plant Science and Technology. The separate programs have been low-award-producing for several years, and their merger will help provide the critical mass needed to avoid this designation in the future. The proposed Ph.D. in Plant Science and Technology curriculum incorporates improvements better to serve students' academic interests and career goals. This structure is expected to be more attractive to students and employers, better reflect the state of the field, and more accurately represent the department faculty expertise. Any increases in enrollment can be supported by additional tenure-track faculty who recently joined the department, thus increasing departmental capacity to offer more courses. These faculty have expertise in plant science and technology, such as plant physiology, weed science, corn production, and plant science for dairy sustainability. The expertise of all faculty will position the Department of Plant and Agroecosystem Sciences to train plant scientists skilled in applying new technologies for precision agriculture, such as remote sensing and artificial intelligence.

Institution and Universities of Wisconsin Program Array

The new program is not expected to adversely affect other graduate programs at UW-Madison or within the Universities of Wisconsin. Following the approval of the new degree, the department plans to suspend and discontinue the Ph.D. in Agronomy and Ph.D. in Horticulture programs, and there are no equivalent doctoral programs in the Universities of Wisconsin.

The Ph.D. in Botany at UW-Madison attracts students with different research interests and is classified as a biological rather than agricultural science program in the Classification of Instructional Programs (CIP) structure. Other programs at UW-Madison that may be considered related to the Ph.D. in Plant Science and Technology are the Ph.D. in Plant Pathology and the Ph.D. in Plant Breeding and Plant Genetics. The Ph.D. in Plant Pathology focuses on the biology of plant pathogens and the effects and control of plant disease. The Ph.D. in Plant Science and Technology has a broader focus on agricultural systems and the biological processes that impact plant growth and production. The Ph.D. in Plant Science and Technology program is designed to be distinct from the Ph.D. in Plant Breeding and Plant Genetics and does not incorporate focused training in this study area.

Need as Suggested by Student Demand

A limited survey of undergraduate and graduate students in the College of Agricultural and Life Sciences was conducted in February 2024. Of the 86 respondents, 32 indicated that they were interested or very interested in a graduate program in plant science and technology.

National Center for Education Statistics data were used to estimate student demand for plant science degrees. For US land-grant institutions in 2022, there were 251 Ph.D. degrees awarded for CIP codes 01.1101 Plant Sciences, General; 01.1102 Agronomy and Crop Science; 01.1103 Horticultural Science; and 01.1199 Plant Sciences, Other. This figure includes the UW-Madison programs in agronomy and horticulture, which awarded four degrees in 2022. Data from the National Center for Science and Engineering Statistics indicate that doctoral degrees in plant sciences increased from 152 to 162 between 2021-2022.[1] These numbers point to increased opportunities to grow the number of plant science graduate degrees awarded by UW-Madison. The program redesign, faculty capacity, and the potential to support research assistantships will support increased enrollments, thereby increasing the department's ability to recruit and retain graduate students.

Need as Suggested by Market Demand

The Ph.D. in Plant Science and Technology will prepare students for careers in academia and the agriculture sector. Graduates of the UW-Madison Ph.D. in Agronomy and Ph.D. in Horticulture have gone on to academic or research-related careers, pursued work in the private agricultural industry, or served public agencies like the U.S. Department of Agriculture, Wisconsin Department of Natural Resources, Wisconsin Department of Agriculture, Trade and Consumer Protection, and Extension. The department expects the same career opportunities to be available to graduates of the new Ph.D. in Plant Science and Technology.

[1] National Science Foundation, National Center for Science and Engineering Statistics. Survey of Earned Doctorates. Retrieved from https://ncses.nsf.gov/pubs/nsf24300/data-tables

According to the National Center for Science and Engineering Statistics, Survey of Earned Doctorates,[2] the median basic annual salary for research doctorate recipients in the fields of agricultural sciences and natural resources (including plant scientists) was $84,000. Those working in industry had a median basic salary of $95,000. The median basic salary for academic employment was $65,000, including tenure-track, non-tenure-track, and postdoctoral positions.

In the Occupational Outlook Handbook[3] produced by the U.S. Bureau of Labor Statistics, plant scientists are in the occupational category of Agricultural and Food Scientists. This survey does not distinguish between entry-level jobs and those requiring a graduate degree. Still, the total number of jobs in 2022 was 35,400, with a higher-than-average projected growth of 6 percent over 2023-2033. The 2022 median pay was $79,940 per year. The top industries for agricultural and food scientists were research and development in the physical, engineering, and life sciences; food manufacturing; government; and colleges, universities, and professional schools. Occupational projections also indicate that the number of Natural Science Managers positions is expected to rise by 7,500 or 8 percent, over the same decade. Anticipated occupational growth is expected in the same decade for postsecondary teachers. Typically, postsecondary instructors must hold a Ph.D. in the discipline. Growth of 5 percent is expected for postsecondary instructors in the agriculture sciences and 8 percent in the biological sciences.[4]

[2] National Science Foundation, National Center for Science and Engineering Statistics. Survey of Earned Doctorates. Retrieved from https://ncses.nsf.gov/pubs/nsf24300/data-tables

[3] U.S. Bureau of Labor Statistics, *Occupational Outlook Handbook*, Agricultural and Food Scientists, https://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm (accessed Mar. 2, 2025)

[4] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Postsecondary Teachers. Retrieved February 2025 from https://www.bls.gov/ooh/education-training-and-library/postsecondary-teachers.htm

University of Wisconsin-Madison
Cost and Revenue Projections For PhD-Plant Science and Technology

	Items	Projections				
		2025-26	2026-27	2027-28	2028-29	2029-30
		Year 1	Year 2	Year 3	Year 4	Year 5
I	**Enrollment (New Student) Headcount**	0	5	5	5	5
	Enrollment (Continuing Student) Headcount	4	4	8	11	11
	Enrollment (New Student) FTE	0	5	5	5	5
	Enrollment (Continuing Student) FTE	4	4	8	11	11
II	**Total New Credit Hours**					
	Existing Credit Hours (pre-dissertator)	32	72	104	128	128
	Existing Credit Hours (dissertator)	12	27	39	48	48
	Existing Credit Hours	44	99	143	176	176
III	**FTE of New Faculty/Instructional Staff**					
	FTE of Current Fac/IAS	2	2	3	3	3
	FTE of New Admin Staff					
	FTE Current Admin Staff	1	1	1	1	1
IV	**Revenues**					
	Tuition (based on $670.47/credit)	$ 29,500.68	$ 66,376.53	$ 95,877.21	$ 118,002.72	$ 118,002.72
	Program Revenue (grant funding for assistantships)	$100,000	$100,000	$200,000	$200,000	$200,000
	Tuition Remission Surcharge (for assistanships from grants)	$15,840	$15,840	$31,680	$43,560	$43,560
	Program Revenue - Other					
	GPR (re)allocation	$274,037	$244,532	$313,754	$328,663	$339,672
	Total Revenue	**$419,378**	**$426,749**	**$641,311**	**$690,226**	**$701,235**
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary	$220,000	$224,400	$343,332	$350,199	$357,203
	Instuctional Academic Staff					
	Administrative and Student Support Staff	$50,000	$51,000	$52,020	$53,060	$54,122
	Fringe Faculty and Academic Staff (36.5%)	$98,550	$100,521	$144,303	$147,190	$150,133
	Assistanships (from grants)	$34,988	$34,988	$69,976	$96,217	$96,217
	Facilities and Capital Equipment					
	University buildings and space					
	Capital Equipment					
	Operations					
	Other Expenses					

	Other (tuition remission for assistantships) Other (please list)	$15,840	$15,840	$31,680	$43,560	$43,560
	Total Expenses	**$419,378**	**$426,749**	**$641,311**	**$690,225**	**$701,234**
	Net Revenue	**$0**	**$0**	**$0**	**$0**	**$0**

Provost's Signature: **Date:** 1/16/25

Chief Business Officer's Signature: **Date:** 12/20/24

COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN-MADISON
DOCTOR OF PHILOSOPHY IN PLANT SCIENCE AND TECHNOLOGY

PROGRAM INTRODUCTION

The proposed Doctor of Philosophy (Ph.D.) in Plant Science and Technology is an in-person doctoral degree program comprised of 51 credits. The Department of Plant and Agroecosystem Sciences proposes merging two existing Ph.D. programs, namely the Ph.D. in Agronomy and the Ph.D. in Horticulture, to become the new Ph.D. in Plant Science and Technology. The formerly separate Departments of Agronomy and Horticulture merged into one department in 2023, and this proposal is consistent with the merger of the departments.

COST REVENUE NARRATIVE

Section I – Enrollment

The program expects the Ph.D. in Plant Science and Technology to start with an initial enrollment of four students in Year 1. These students represent those who decide to transition from either the Ph.D. in Agronomy or the Ph.D. in Horticulture to the new program. Enrollment is expected to reach approximately 16 students by Year 5 and hold steady at around 16 students thereafter. By the end of Year 5, it is expected that 25 students will have enrolled in the program and four students will have graduated. Thereafter, it is expected that each year, 2 to 4 students will graduate, and five new students will join the program. The expected time to complete the degree is five years. Students will enroll full-time so that student FTEs will match the student headcounts.

Section II – Credit Hours

The Ph.D. in Plant Science and Technology requires 51 credits, which will be distributed over five academic years for most students, and this is the assumption used in the budget model. The budget model assumes each full-time student will enroll in 16 credits in their first two years of the program before their preliminary examination. After examinations, students are expected to enroll in six credits in the remaining academic years. The budget calculation assumes that 50 percent of enrolled students are in dissertator status each year, thus enrolling in six credits. Student credit hours are projected to be 44 in Year 1 and 176 by Year 5.

Section III – Faculty and Staff Appointments

There are currently a total of 2.0 FTEs of continuing faculty that will support this program. There is also 1.0 FTE current administrative staff who will support the program. Initially, no new faculty or staff will be hired to support this program specifically, as individuals supporting the two distinct graduate programs will transition to support the combined programs. A portion of the core curriculum will be shared with the M.S. in Plant Science in Technology. This will increase departmental capacity to support enrollment growth in the Ph.D. program. The budget spreadsheet shows a relatively small year-to-year increase in faculty and staff FTE dedicated to the program as enrollments and credit hours grow.

Section IV – Program Revenues

Students in the proposed Ph.D. in Plant Science and Technology will pay standard graduate tuition and segregated fees. The costs and revenues of the proposed program will be managed as part of the UW–Madison instructional/tuition pool (i.e., Fund 101). Tuition revenues will be allocated from the pool to the College of Agricultural and Life Sciences to support the faculty and staff for instructional, advising, and administration within the regular budget allocation process.

Tuition

Standard tuition and fee rates will apply for students enrolled in the Ph.D. in Plant Science and Technology program. For graduate students, the 2024-25 academic year tuition rates for WI residents enrolled as full-time students are $5,363.76 per semester ($670.47 per credit) and $12,027.20 per semester ($1,503.40 per credit) for non-residents. Using the Wisconsin resident per credit tuition rate, the annual tuition revenue is projected to be approximately $29,501 in Year 1 and $118,003 by Year 5.

Fees

Students who have completed all but the dissertation requirements pay a continuous registration fee of $470.47 for residents and $670.47 for non-residents. These fees are not included in the cost and revenue projections.

Program Revenues and GPR

At UW–Madison, tuition revenues are pooled with state GPR funds and certain other revenues (e.g., indirect costs, ancillary revenues) at the institution level. Funds are then apportioned to each school/college. The College of Agriculture and Life Sciences funds may be used and reallocated to fund program delivery. The Department of Plant and Agroecosystem Sciences makes a conscious effort each admissions cycle to balance admission offers and anticipated acceptance rates with the ability to fund each student through research and project assistantships. Research and project assistantships are primarily funded with faculty grant money, and teaching assistantships are funded by department revenue from undergraduate teaching and GPR dollars from the college.

Grants/Extramural Funding

Extramural funding to faculty research programs will be used to support graduate students in assistantships and is treated here as revenue to support the program. The budget model shows that approximately one-third of students will be granted assistantships. Grant funding is also the source for the tuition remission surcharge of $12,000 per assistantship, partially covering the tuition remission received by students with assistantships.

Section V – Program Expenses

The university will not incur new costs associated with this program, as resources supporting the current Ph.D. in Agronomy and the Ph.D. in Horticulture will transition to support the combined program.

Salary and Fringe

The proposed Ph.D. in Plant Science and Technology will be staffed by existing program faculty and staff. The current related salary expenses are 2.0 faculty FTEs, averaging $110,000 per year, and 1.0 FTE of administrative staff at $50,000 per year. Salary projections apply a 2 percent inflationary rate. A fringe rate of 36.50 percent for faculty and academic staff is utilized and incorporated into the expenses illustrated in this section. Assistants will be funded from grants, and that scenario is shown based on the assistantship rate of $26,506 per academic year.

Facilities and Capital Equipment

The program will use existing facilities for instruction in the Department of Plant and Agroecosystem Sciences, which are operated and maintained through the department's budget. No additional expenses, facilities, or capital equipment are required for the program.

Other Expenses

Other expenses include tuition remissions for graduate students in Teaching Assistantship, Project Assistantship, or Research Assistantship positions. Supplies, marketing, program materials, and university service charges are expected to remain at the program's current level beyond the initial year.

Section VI – Net Revenue

The Ph.D. in Plant Science and Technology is a traditional pooled tuition program and will be revenue-neutral. Tuition revenues from students in this program will be pooled at the institution level and used to support student instruction and service. This program is also funded by reallocating staff and faculty resources from the existing Ph.D. in Horticulture and Ph.D. in Agronomy programs. Graduate students have funding support via assistantships through faculty grant money and department GPR dollars.

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

Date: 17 January 2025

To: Jay O. Rothman, President, Universities of Wisconsin

CC: Johannes Britz, Interim Senior Vice President for Academic and Student Affairs
Tracy Davidson, Associate Vice President for Academic Affairs
Diane Treis, Director of Academic Programs and Student Learning Assessment

From: Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

Subject: Request for Authorization to Implement: PhD-Plant Science and Technology

Submitted Via Email Only to: oaa@wisconsin.edu

In keeping with UW System and Board of Regents policy, I am sending you a Request for Authorization to Implement a new PhD-Plant Science and Technology program at the University of Wisconsin–Madison.

The program is designed to meet UW–Madison's definition and standards of quality and will make a meaningful contribution to the university's mission, overall academic plan, and academic degree program array. There is university-wide support for the program, and all relevant and required governance bodies have completed their review processes. In addition, the necessary financial, capital, and human resources are in place and/or have been committed to implement and sustain the program. I thus send the proposal forward with broad university-wide support, governance approval, and my endorsement.

Contingent upon Board of Regents approval, the faculty plan to implement the new program in summer 2025 with first enrollments in the fall of 2025. We are requesting that this proposal be scheduled for consideration at the April 2025 Board of Regents meeting. Please contact Karen Mittelstadt (mittelstadt@wisc.edu) with any questions about these materials.

Attachments: Request for Authorization to Implement (Parts A and B), Cost and Revenue Projections, Cost and Revenue Projections Narrative

Copies:
Jennifer L. Mnookin, Chancellor, UW–Madison
Glenda Gillaspy, Dean and Director, College of Agricultural and Life Sciences
Jeri Barak, Associate Dean for Academic Affairs, CALS
Megan Ackerman-Yost, Assistant Dean for Academic Programs and Policies, CALS
William Karpus, Dean, Graduate School
Jenna Alsteen, Assistant Dean, Graduate School
Rob Cramer, Vice Chancellor for Finance and Administration
David Murphy, Associate Vice Chancellor for Finance and Administration
Allison La Tarte, Vice Provost, Data, Academic Planning & Institutional Research
Karen Mittelstadt, Institutional Academic Planner, Data, Academic Planning & Institutional Research

Office of the Provost and Vice Chancellor for Academic Affairs
150 Bascom Hall University of Wisconsin-Madison 500 Lincoln Drive Madison, Wisconsin 53706
608/262-1304 Fax: 608/265-3324 E-mail: provost@provost.wisc.edu www.provost.wisc.edu

Education Committee
April 16, 2025

Item C.6.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION)
DOCTOR OF PHILOSOPHY IN
ECOLOGY AND EVOLUTIONARY BIOLOGY
UNIVERSITY OF WISCONSIN–MADISON

REQUESTED ACTION

Adoption of Resolution C.6., authorizing the implementation of the Doctor of Philosophy in Ecology and Evolutionary Biology at the University of Wisconsin–Madison.

Resolution C.6. That, upon the recommendation of the Chancellor of the University of Wisconsin–Madison and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Doctor of Philosophy in Ecology and Evolutionary Biology program at the University of Wisconsin–Madison.

SUMMARY

The University of Wisconsin (UW)-Madison proposes to establish a Doctor of Philosophy (Ph.D.) in Ecology and Evolutionary Biology. The program will be housed in the Department of Entomology in the College of Agricultural and Life Sciences. UW-Madison is a national leader in ecology and evolutionary biology research but currently does not offer a formal graduate degree in the field, unlike nearly all institutional peers. The addition of a doctoral program in ecology and evolutionary biology would increase visibility and bring national and international recognition, highlighting UW-Madison's faculty expertise, extending interdisciplinary research and educational excellence in the biological sciences, and promoting engagement in these disciplines beyond the university. The Ph.D. in Ecology and Evolutionary Biology program curriculum comprises 51 credits. It will emphasize foundational training and integration of both disciplines, with greater depth and research contributions expected in one discipline of specialization. Graduates will be prepared for careers in biotechnology, agriculture, environmental science, academia, state and federal agencies, and non-profit organizations in related research. Overall, the U.S. Bureau of Labor Statistics projects higher than average growth for occupations related to the life sciences. Standard graduate tuition will apply.

Presenter

- Dr. Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting, available at https://www.wisconsin.edu/uw–policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

REQUEST FOR AUTHORIZATION TO IMPLEMENT A DOCTOR OF PHILOSOPHY IN ECOLOGY AND EVOLUTIONARY BIOLOGY AT THE UNIVERSITY OF WISCONSIN-MADISON PREPARED BY UW-MADISON

ABSTRACT

The University of Wisconsin (UW)-Madison proposes to establish a Doctor of Philosophy (Ph.D.) in Ecology and Evolutionary Biology. The program will be housed in the Department of Entomology in the College of Agricultural and Life Sciences. UW-Madison is a national leader in ecology and evolutionary biology research but currently does not offer a formal graduate degree in the field, unlike nearly all institutional peers. The addition of a doctoral program in ecology and evolutionary biology would increase visibility and bring national and international recognition, highlighting UW-Madison's faculty expertise, extending interdisciplinary research and educational excellence in the biological sciences, and promoting engagement in these disciplines beyond the university. The Ph.D. in Ecology and Evolutionary Biology program curriculum comprises 51 credits. It will emphasize foundational training and integration of both disciplines, with greater depth and research contributions expected in one discipline of specialization. Graduates will be prepared for careers in biotechnology, agriculture, environmental science, academia, state and federal agencies, and non-profit organizations in related research. Overall, the U.S. Bureau of Labor Statistics projects higher than average growth for occupations related to the life sciences. Standard graduate tuition will apply.

PROGRAM IDENTIFICATION

University Name
University of Wisconsin-Madison

Title of Proposed Academic Program
Ecology and Evolutionary Biology

Degree Designation
Doctor of Philosophy (Ph.D.)

Proposed Classification of Instructional Program (CIP) Code
26.1310 Ecology and Evolutionary Biology

Mode of Delivery
Single Institution; In-person

Department or Functional Equivalent
Department of Entomology

College, School, or Functional Equivalent
College of Agricultural and Life Sciences

Proposed Date of Authorization
April 2025

Proposed Date of Implementation
Fall 2025

PROGRAM INFORMATION

Overview of the Program

Ecology is the study of how biodiversity is shaped by interacting species and their environment. Evolutionary biology is the study of how biodiversity is generated over time. Together, ecology and evolutionary biology are an interdisciplinary field of study seeking to understand how the diversity of life, at multiple biological levels of organization, is shaped by processes that act over spatial and temporal scales. For decades, UW-Madison has been a national leader in ecology and evolutionary biology research, ranking in the top 10 for number of articles, citations, and grant dollars for both disciplines. As a university that has been instrumental in the formation and advancement of ecology and evolutionary biology scholarship for a century, the addition of a formal doctoral program represents an important opportunity for students and faculty. It would significantly raise the profile of UW-Madison, which should be ranked a world leader in this field.

The proposed program will bring national recognition to the existing faculty's expertise in ecology and evolutionary biology at UW-Madison. At UW-Madison, more than 110 faculty members conduct research on ecology and/or evolution. The program will increase the visibility of this work, making UW-Madison more competitive for training grants, such as through the National Science Foundation Research Traineeship Program (NRT). Consequently, the introduction of this program will improve graduate student recruitment. It will offer advanced training that enhances the career prospects of graduates in a vital and growing discipline that impacts both basic and applied biological sciences. Furthermore, implementing the program will foster community engagement on campus, emphasize a diverse, inclusive environment, and strengthen connections across the university. Beyond the university, the program will generate benefits related to the public's

understanding and management of our shared natural environment for current and future generations, consistent with the Wisconsin Idea.

The proposed Ph.D. in Ecology and Evolutionary Biology program would be offered in collaboration with faculty across the university who work in this area. There is no anticipated need for new faculty, instructors, or staff; current resource levels can support the new program. A cross-unit, interdepartmental program committee will provide program oversight (e.g., curriculum, policies, admissions, trainer approval, and other information). The program committee will report to the home department of Entomology, which will be ultimately responsible for the program under the academic structure for shared governance. As with all graduate degree programs offered by UW-Madison, students will be housed in the Graduate School.

Projected Enrollments and Graduates by Year Five

Table 1 represents enrollment and graduation projections for students entering the Ph.D. in Ecology and Evolutionary Biology program over the next five years. Over the program's first five years, it is projected that 72 students will have enrolled, and 10 students will have graduated. By the end of Year 5, it is expected that approximately 64 students will be enrolled in the program. The projections are based on trends across existing UW-Madison doctoral programs in the Biological Sciences.[1] To reach these calculations, the department employed the median time-to-degree for doctoral students (5.3 years). The average student retention rate in these programs is approximately 84 percent.[1] Over the program's first five years, retention and completion are expected to be 86 percent.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	12	15	15	15	15
Continuing Students	0	10	23	36	49
Total Enrollment	12	25	38	51	64
Graduating Students	0	0	0	0	10
Attrition	2	2	2	2	2

Tuition Structure

For the academic year 2024-25, full-time graduate tuition and segregated fees for students enrolled in 8 or more credits total $12,324.14 for Wisconsin residents and $25,651.02 for non-residents and international students. Of these totals, $798.31 per

[1] UW-Madison Graduate School. 2024. Graduate School Degrees, Retention, and Completion Data. Retrieved from: https://grad.wisc.edu/data/degrees-awarded.

semester is attributable to segregated fees. Students who have completed all but the dissertation requirements pay a continuous registration fee of $470.47 for residents and $670.47 for non-residents. Some students will receive funding support from research assistantships.

Student Learning Outcomes and Program Objectives

The proposed interdisciplinary Ph.D. in Ecology and Evolutionary Biology would create a setting for graduate students to gain expertise in ecology and evolutionary biology and prepare for a range of careers. Graduates will be at an advantage among peers in pursuing academic and business careers, the two largest employment sectors for Ph.D. graduates. Graduate career paths are diverse and include biotechnology, natural resource management, agriculture, conservation, environmental consulting, education, non-profit organizations, and governmental agencies, among others. Graduates of the proposed program will be able to:

1. Evaluate major theories and research approaches in ecology and evolutionary biology.
2. Integrate knowledge of ecological and evolutionary processes to interpret patterns across multiple temporal and spatial scales.
3. Apply quantitative skills, while using insight and creativity to conduct rigorous original research in one or both fields.
4. Demonstrate professional skills, ethical responsibility, and effective communication while teaching or conducting outreach in the fields of ecology and evolution.

Program Requirements and Curriculum

The Ph.D. in Ecology and Evolutionary Biology admission requirements will meet those set by UW-Madison Graduate School policies. Applicants must hold a bachelor's degree from an accredited U.S. institution of higher education or a comparable degree from an international institution. Applicants must also provide three letters of recommendation, a transcript, a resume, and a statement of purpose. International students whose first language is not English or whose undergraduate instruction was not in English must submit a Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score.

As prerequisites for admission, students will have completed at least one course from four of the following five areas (12 credits): ecology; evolution; genetics, cellular, molecular, or developmental biology; organismal biology, systematics, or biodiversity; and quantitative analytical skills. The program committee will develop and maintain a list of equivalent UW-Madison courses. The admissions committee will determine whether a student may be permitted to fulfill prerequisites while in the program.

Table 2 illustrates the curriculum for the program. The Ph.D. in Ecology and Evolutionary Biology program curriculum will emphasize foundational training and integration of both disciplines, with greater depth and research contributions expected in

one discipline of specialization. Students will complete at least 51 credits in the program, with at least half at the graduate level and a minimum of 32 credits in residence at UW-Madison. Students will begin their training through a cohort-based model. All students will be required to complete Foundations of Evolution (2 credits) and Foundations of Ecology (2 credits) in their first year. Students will complete one additional graduate course integrating ecology and evolutionary processes (3 credits), and graduate seminar courses providing advanced knowledge in a relevant subfield (4 credits, with at least two taken prior to dissertator status).

All students will be expected to pursue multidisciplinary training through coursework, teaching, and outreach, with the requirement of one semester of teaching or the equivalent in sustained outreach activities (e.g., one year of service on the executive committee of the Center for Ecology and the Environment, or the J. F. Crow Institute for the Study of Evolution). Lastly, all students will be required to complete training based on the advice of their dissertation committee that contributes to their professional development (e.g., additional coursework, internships, workshops, service, etc.). Students must successfully complete a written and an oral preliminary examination. The student must present an exit seminar on their dissertation research and subsequently defend the thesis orally during a final examination. A deposit of the doctoral dissertation to the Graduate School is required.

Table 2: Ph.D. in Ecology and Evolutionary Biology Program Curriculum

Academic degree program or major course requirements:	
Foundations of Ecology and Evolution Requirement	**4 credits**
Students must complete the courses below:	
ENTOM/BOTANY/GENETICS/ZOOLOGY 820: Foundations of Evolution	2 credits
ENTOM/BOTANY/F&W ECOL/ZOOLOGY 821: Foundations of Ecology	2 credits
Ecology and Evolutionary Processes Requirement	**3 credits**
Students must complete one of the following 3 credit courses:	
ENTOM/ZOOLOGY 540: Theoretical Ecology, or	
ENTOM/GENETICS/ZOOLOGY 624: Molecular Ecology, or	
F&W ECOL/BOTANY/ENVIR ST/ZOOLOGY 651: Conservation Biology, or	
F&W ECOL/ZOOLOGY 660: Climate Change Ecology	
Seminar Requirement	**4 credits**
Students must complete at least 2 courses and 4 credits from the following courses. At least two courses must be completed prior to reaching dissertator status.	
BOTANY 950: Seminar-Plant Ecology	1 credit
ENTOM 901: Seminar in Organismal Entomology	1 credit
F&W ECOL/ATM OCN/BOTANY/ENVIR ST/GEOG/GEOSCI/ZOOLOGY 980: Earth System Science Seminar	1 credit
	0-1 credit

Genetics 993: Seminar in Genetics ZOOLOGY 956: Seminar-Ecology	1 credit
Elective requirement Coursework to meet the elective requirement will be determined through consultation with the student's advisor and members of their committee and based on the student's specific educational needs.	**6-12 credits**
ENTOM/BOTANY/ZOOLOGY 473: Plant-Insect Interactions	3 credits
AN SCI/F&W ECOL/ZOOLOGY 521: Birds of Southern Wisconsin	3 credits
ZOOLOGY 611: Comparative and Evolutionary Physiology	3 credits
BOTANY/PL PATH 563: Phylogenetic Analysis of Molecular Data	3 credits
ZOOLOGY/GEOSCI 541: Paleobiology	3 credits
GENETICS/BIOLOGY 522: Communicating Evolutionary Biology	2-3 credits
GENETICS 633: Population Genetics	3 credits
ENTOM 450: Basic and Applied Insect Ecology	3 credits
F&W ECOL/BOTANY/ZOOLOGY 879: Advanced Landscape Ecology	3 credits
ENVIR ST/ZOOLOGY 510: Ecology of Fishes	3 credits
ENVIR ST/PHILOS 441: Environmental Ethics	3 credits
F&W ECOL/SURG SCI 548: Diseases of Wildlife	3-4 credits
F&W ECOL 550: Forest Ecology	3 credits
LAND ARC 668: Restoration Ecology	3 credits
Research requirement The remainder of the coursework to meet the minimum credit requirement will be met via research courses selected in consultation with the student's advisor and members of their committee.	**28-34 credits**
ENTOM 990: Graduate Research and Thesis	1-12 credits
F&W ECOL 990: Research and Thesis	1-12 credits
GENETICS 990: Research	1-12 credits
PL PATH 990: Research	1-12 credits
SOIL SCI 990: Research	1-12 credits
ENVIR ST 990: Research	1-12 credits
GEOG 990: Research and Thesis	1-12 credits
BOTANY 995: Research-Plant Ecology	1-12 credits
ZOOLOGY 990: Research	1-12 credits
Total Credits	**51 credits**

Collaborative Nature of the Program

The proposed Ph.D. in Ecology and Evolutionary Biology would be offered as a collaboration among faculty across the university who work in this area. The Ph.D. in Ecology and Evolutionary Biology will have a program committee composed of faculty, staff, and students from the College of Agriculture and Life Sciences, the College of Letters & Science, and at-large members broadly drawn from the campus ecology and evolutionary biology community. This includes faculty and staff in the Nelson Institute for Environmental Studies, the School of Veterinary Medicine, the School of Computer Data

and Information Sciences, and the School of Medicine and Public Health. The program committee will provide program oversight (e.g., curriculum, policies, admissions, trainer approval, and other information). The program will work closely with the Center for Ecology and the Environment and the J. F. Crow Institute for the Study of Evolution to sustain graduate student professional development, community, and outreach activities.

Projected Time to Degree

The projected time to degree completion is 5.3 years, based on full-time continuous enrollment. This projection reflects the median expected time to complete all degree requirements, consistent with existing UW-Madison doctoral programs in biological sciences.

Accreditation

The proposed program does not require programmatic accreditation. The program will be included under UW-Madison's institutional accreditation through the Higher Learning Commission.

PROGRAM JUSTIFICATION

Rationale

Over the last decade, the UW-Madison community members involved in the field of ecology and evolutionary biology have taken action to organize and extend their work. The formation of the J.F. Crow Institute for the Study of Evolution in 2010 and the Center for Ecology and the Environment in 2020 have significantly strengthened research in these two fields at the university. However, the distributed structure of the community and the non-academic nature of the institutes/centers present challenges to providing cutting-edge graduate education, along with concomitant problems in recruiting top students and faculty in the field. Further progress is limited by a lack of robust channels that link the ecology and evolutionary biology communities.

Despite the university's existing strengths in ecology and evolutionary biology, recruiting top graduate students is often challenging when no specific program attracts them to UW-Madison. This increasingly complicates recruitment and retention of the best in the field. One of the key benefits of creating a new program is attracting students who are unaware of UW-Madison's strengths in this field or want their degree to reflect a focus in ecology and evolutionary biology explicitly. Developing a formal graduate program would immediately elevate UW-Madison's visibility to prospective students in this field and provide faculty with a mechanism to recruit these students into their labs.

The UW-Madison 2020-2025 Strategic Framework aims to demonstrate excellence in teaching and educational achievement, research and scholarship, and living the Wisconsin Idea. To address these institutional goals, the Ph.D. in Ecology and Evolutionary Biology

would build on UW-Madison's core mission to foster interdisciplinary research and educational excellence in the biological sciences and to promote engagement in these disciplines beyond the university.

The Ph.D. in Ecology and Evolutionary Biology would create a setting for faculty and graduate students to collaborate and innovate around shared research interests in ecology and evolution and offer enhanced graduate training by developing a curriculum that prepares students for a range of careers. This would provide a well-structured cohort experience for students and strengthen connections between ecology and evolutionary biology. To foster awareness of the field, the university's ecology and evolutionary biology campus community provides important outreach to the community. This includes engaging in outreach to undergraduate students, K-12 educators and students, and the public. Outreach efforts are supported by some 15 years of experience organizing Darwin Day outreach events each February and presenting workshops at the National Science Teachers Association. Outreach is particularly challenging and important given widespread misconceptions about science and socioeconomic and geographic disparities in the quality of natural science education and access to natural areas. Engagement in outreach activities will ensure that the program will significantly impact the broader community.

Institution and Universities of Wisconsin Program Array

The proposed Ph.D. in Ecology and Evolutionary Biology will not produce unnecessary duplication in the Universities of Wisconsin. The closest program at the University of Wisconsin-Madison is the Ph.D. in Integrative Biology. This broad program trains graduate students in cellular and molecular biology, developmental biology, neuroscience, physiology, ecology, evolution, and animal behavior. However, the Ph.D. in Integrative Biology does not require coursework that provides multidisciplinary training in both ecology and evolutionary biology to a cohort of students.

There is no other graduate program offered by UW universities utilizing CIP 26.1310, Ecology and Evolutionary Biology. Within the broader CIP category of 26.13, Ecology, Evolution, Systematics, and Population Biology, UW-Milwaukee offers a Ph.D. in Epidemiology (26.1309). In addition, UW-Milwaukee's Department of Biological Sciences maintains a research group in ecology, evolution, and behavior. At the master's degree level, UW-Stout offers an M.S. in Conservation Biology.

Need as Suggested by Student Demand

Members of the UW-Madison community involved in ecology and evolutionary biology have expressed very strong support for creating a formal doctoral program. In both February 2019 and October 2023, university faculty conducted surveys of UW-Madison ecology and evolutionary biology faculty and graduate students. Survey results were consistent across years. In both samples, 90 percent of the faculty respondents believed that an ecology and evolutionary biology doctoral degree would increase the visibility and national prominence of UW-Madison in this field, and 71 percent felt it would attract higher

caliber applicants. Additionally, 82 percent of the doctoral student respondents believed that the presence of an ecology and evolutionary biology program would improve their overall educational experience, and 64 percent believed earning an ecology and evolutionary biology doctoral degree would improve their professional outcomes beyond the degree their department offers. In the 2019 survey, 72 percent of the 18 postdoc respondents were unaware of the breadth and depth of UW-Madison research in ecology and evolutionary biology when they were considering graduate programs, and 61 percent stated the existence of an ecology and evolutionary biology doctoral program would have raised UW-Madison's profile in their graduate school search.

UW-Madison faculty and students are already strongly engaged in strengthening the presence of the ecology and evolutionary biology discipline on campus. Graduate students who currently self-associate with the Center for Ecology and the Environment and the J. F. Crow Institute for the Study of Evolution contribute to community-building events and work hand-in-hand with faculty, including facilitating communication among 500-plus email listserv members, supporting two websites (ecology.wisc.edu, and evolution.wisc.edu), hosting seminar series and symposia, teaching and mentoring undergraduates, and sustaining an ambitious array of outreach events aimed at K-12 students, educators, and the general public. Based on feedback from graduate committees and warrant information, many current doctoral students complete coursework in ecology and/or evolutionary biology above and beyond the requirements of their degree programs out of widespread interest in advanced training in this discipline.

Need as Suggested by Market Demand

According to the National Science Foundation Survey of Earned Doctorates,[2] 600-700 students have earned degrees in ecology and evolution annually since 2010. Graduate programs in ecology and evolutionary biology are widely present among UW-Madison peer institutions, including 11 of the 14 universities participating in the Big Ten Academic Alliance, and 52 of the 63 universities participating in the Association of American Universities. Yet, unlike nearly all peers, UW-Madison offers no formal graduate degree in ecology and evolutionary biology. Despite this, the university appears in ranked lists of graduate programs in ecology and evolutionary biology as 12th nationally, suggesting a formal program would elevate this ranking to among the very best grad programs in ecology and evolutionary biology.[3]

Graduates with doctoral degrees in ecology and evolutionary biology will be prepared for careers in biotechnology, agriculture, environmental science, state and federal agencies, and non-profit organizations in related research. According to the U.S. Department of Labor, Occupational Outlook Handbook, employment in occupational areas

[2] National Science Foundation. 2022. Survey of Earned Doctorates (SED). Retrieved at https://www.nsf.gov/statistics/srvydoctorates/. Published September 28, 2023.
[3] US News and World Report. 2022. Best Ecology Graduate Programs - US News Rankings.

related to life sciences is expected to grow faster than average between 2023-2033. In life science occupations, the median annual wage is $88,620 for all degree levels. Those with doctoral degrees are expected to earn on average $100,000 more than those with a master's degree or less.[4] More specifically, 7 percent growth is expected over the decade in the occupational area of environmental scientists.[5] Anticipated occupational growth is expected in the same decade for postsecondary teachers. Typically, postsecondary instructors must hold a Ph.D. in the discipline. Growth of 8 percent is expected for postsecondary instructors the biological sciences.[6]

[4] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Life, Physical, and Social Science Occupations. 2023. Retrieved at https://www.bls.gov/ooh/life-physical-and-social-science/home.htm.

[5] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Environmental Scientists and Specialists, at https://www.bls.gov/ooh/life-physical-and-social-science/environmental-scientists-and-specialists.htm (visited February 12, 2025).

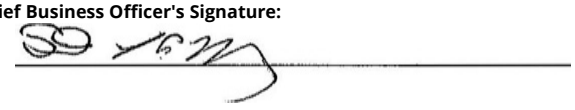
[6] Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Postsecondary Teachers. Retrieved February 2025 from https://www.bls.gov/ooh/education-training-and-library/postsecondary-teachers.htm

University of Wisconsin-Madison
Cost and Revenue Projections For PhD-Ecology & Evolutionary Biology

	Items	Projections				
		2025-26	2026-27	2027-28	2028-29	2029-30
		Year 1	Year 2	Year 3	Year 4	Year 5
I	**Enrollment (New Student) Headcount**	12	15	15	15	15
	Enrollment (Continuing Student) Headcount	0	10	23	36	49
	Enrollment (New Student) FTE	12	15	15	15	15
	Enrollment (Continuing Student) FTE	0	10	23	36	49
II	**Total New Credit Hours**					
	Existing Credit Hours	192	400	608	431	864
III	**FTE of New Faculty/Instructional Staff**					
	FTE of Current Faculty	1	1	1	1	1
	FTE of Current Instructional Staff	1	1	1	1	2
	FTE of New Admin Staff					
	FTE Current Admin Staff	0.5	0.5	0.5	0.5	1
IV	**Revenues**					
	Tuition ($670.47/credit WI, $1,503.40/credit Non)	$ 208,692	$ 434,774	$ 660,856	$ 468,469	$ 939,112
	Program Revenue (grant funding for assistantship support)	$422,147	$617,687	$813,365	$1,009,186	$1,256,865
	Tuition Remission Surcharge (for assistantships from grants)	$144,000	$300,000	$456,000	$612,000	$768,000
	Program Revenue - Other					
	GPR (re)allocation	$100,000	$100,000	$100,000	$100,000	$100,000
	Total Revenue	**$874,839**	**$1,452,461**	**$2,030,221**	**$2,189,655**	**$3,063,977**
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary ($130,000)	$130,000	$132,600	$135,252	$137,957	$140,716
	Instuctional Academic Staff ($90,000)	$90,000	$91,800	$93,636	$95,509	$97,419
	Administrative and Student Support Staff ($70,000)	$35,000	$35,700	$36,414	$37,142	$75,770
	Fringe Faculty and Academic Staff (36.5%)	$93,075	$94,937	$96,835	$98,772	$114,575
	Research Assistantships (from grants)	$318,072	$662,650	$1,007,228	$1,351,806	$1,696,384
	Facilities and Capital Equipment					
	University buildings and space					
	Capital Equipment					
	Operations					
	Other Expenses					
	Other (tuition remission for assistantships)	$208,692	$434,774	$660,856	$468,469	$939,112
	Other (please list)					
	Total Expenses	**$874,839**	**$1,452,461**	**$2,030,222**	**$2,189,655**	**$3,063,977**
	Net Revenue	**$0**	**$1**	**$0**	**$0**	**$0**

Provost's Signature: **Date:** 1/16/25

Chief Business Officer's Signature: **Date:** 12/20/24



COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN-MADISON
DOCTOR OF PHILOSOPHY IN
ECOLOGY AND EVOLUTIONARY BIOLOGY

PROGRAM INTRODUCTION

The University of Wisconsin (UW)-Madison proposes to establish a Doctor of Philosophy (Ph.D.) in Ecology and Evolutionary Biology. The program will be housed in the Department of Entomology in the College of Agricultural and Life Sciences. Ecology is the study of how biodiversity is shaped by interacting species and their environment, and evolutionary biology is the study of how biodiversity is generated over time. Together, ecology and evolutionary biology is an interdisciplinary field of study that seeks to understand how the diversity of life, at multiple biological levels of organization, is shaped by processes that act over spatial and temporal scales. For decades, UW-Madison has been a national leader in ecology and evolutionary biology research, ranking in the top 10 for the number of articles, citations, and grant dollars for both disciplines. UW-Madison has been instrumental in the formation and advancement of ecology and evolutionary biology scholarship for a century. The addition of a formal doctoral program represents an important opportunity for students and faculty. It would significantly raise the profile of UW-Madison, which should be ranked a world leader in this field.

The 51-credit program will be delivered in an in-person format. Students will pay standard graduate tuition and segregated fees. The costs and revenues of the proposed program will be managed as part of the UW–Madison instructional/tuition pool (i.e., Fund 101). Tuition revenues will be allocated from the pool to the College of Agricultural and Life Sciences to support the faculty and staff for instructional, advising, and administration within the regular budget allocation process. Resources for student services and administrative support are anticipated via contributions from the College of Agricultural and Life Sciences and the Department of Entomology once the program is launched. The Graduate School, the Office of the Registrar, and other administrative units will provide additional student services and administrative support typical of all graduate programs.

COST REVENUE NARRATIVE

Section I – Enrollment

It is expected that 12 new students will enroll in the proposed Ph.D. in Ecology and Evolutionary Biology in Year 1 and program enrollment will reach 64 students by Year 5. By the end of Year 5, it is estimated that 10 students will have graduated from the program. Approximately two students are expected to leave the program each year without graduating. To reach these calculations, trends across existing UW-Madison doctoral

programs in the Biological Sciences[1] were evaluated. The expected time to complete the degree is five years. Students will enroll as full-time students so that the student FTEs will match the student headcounts.

Section II – Credit Hours

The Ph.D. in Ecology and Evolutionary Biology is designed to be completed in five years and requires a minimum of 51 credits. Students will generally complete coursework during their first two years of the program and take their preliminary exam at the end of their third year. They will then complete research and writing for their dissertation during their fifth year. The credit hour projections assume students will enroll as full-time students, which is 8 credits in the fall semester, 8 credits in the spring semester as pre-dissertators, and 3 credits per semester as dissertators.

The Ph.D. in Ecology and Evolutionary Biology is projected to generate approximately 192 student credit hours in Year 1 and approximately 864 student credit hours by Year 5. This projection assumes that pre-dissertators will generate 16 credit hours per academic year and dissertators will generate 6 credit hours per academic year. It is also based on the assumption that there will be 12 pre-dissertators in Year 1 of the program, and by Year 5, there will be 48 pre-dissertators and 16 dissertators. Coursework is drawn from existing courses in the Department of Entomology and graduate courses in partnering units across campus.

Section III – Faculty and Staff Appointments

Faculty and instructors from the Department of Entomology and faculty and instructors from collaborating units will teach required courses and are expected to accommodate students in the proposed program at current staffing levels. The Department of Entomology will contribute 11.2 FTEs of faculty, 1.0 FTE of instructional staff, and 9.0 FTE of non-instructional staff. These individuals will contribute a portion of their appointment to directly provide services for the program's equivalent offering(s). In sum, 1.0 FTE of faculty, 1.0 FTE of instructional staff, and 0.5 FTE of administrative staff from the Department of Entomology will be attributed to the proposed program. There is no anticipated need for new faculty, instructors, or staff; current resource levels can support the new program. The curriculum is primarily composed of classes already taught on campus. The Department of Entomology has sufficient staff and faculty resources to absorb the support and administration of this new program.

[1] UW-Madison Graduate School. 2024. Graduate School Degrees, Retention, and Completion Data. Retrieved from: https://grad.wisc.edu/data/degrees-awarded.

Section IV – Program Revenues

Students in the proposed Ph.D. in Ecology and Evolutionary Biology will pay standard graduate tuition and segregated fees. The costs and revenues of the proposed program will be managed as part of the UW–Madison instructional/tuition pool (i.e., Fund 101). Tuition revenues will be allocated from the pool to the College of Agricultural and Life Sciences to support the faculty and staff for instructional, advising, and administration within the regular budget allocation process.

Tuition

To maintain full-time status, each student will enroll in approximately 16 credits per year during their first three years in the program and six credits per year during Year 4 and Year 5. Tuition revenues are estimated, assuming the headcount enrollments are approximately half Wisconsin residents and half nonresidents.

For pre-dissertators in the program, the 2024-25 academic year tuition rate for Wisconsin residents enrolled as full-time students is $5,363.76 per semester and $12,027.20 per semester for nonresidents. These figures do not include segregated fees. For dissertators, the 2024-25 academic year tuition rate for Wisconsin residents enrolled in 3 credits is $1,411.41 per semester and $2,011.41 per semester for nonresidents.

Based on the mix of pre-dissertators, dissertators, Wisconsin residents, and nonresidents, the annual tuition revenue is projected to be approximately $208,692 in Year 1 and $939,112 by Year 5.

Fees

Students who have completed all but the dissertation requirements pay a continuous registration fee of $470.47 for residents and $670.47 for non-residents. These fees are not included in the cost and revenue projections.

Program Revenues and GPR

At UW–Madison, tuition revenues are pooled with state GPR funds and certain other revenues (e.g., indirect costs, ancillary revenues) at the institution level. Funds are then apportioned to each school/college. The College of Agriculture and Life Sciences funds may be used and reallocated to fund program delivery. The Department of Entomology will balance admissions offers and anticipated acceptance rates with the ability to fund each student through graduate assistantships. Extramural funding to faculty research programs will be used to support graduate students in assistantships and is treated here as revenue to support the program. The budget model shows that students will be appointed as assistantships. Grant funding is also the source for the tuition remission surcharge of $12,000 per research assistantship to partially cover the tuition remission received by students with assistantships.

Section V – Program Expenses

Salary and Fringe

The proposed Ph.D. in Ecology and Evolutionary Biology will be staffed by existing program faculty and staff. The current related salary expenses are 1.0 faculty FTEs, averaging $130,000 per year; 1.0 FTEs of instructional staff, averaging $90,000 per year; and 0.5 FTEs of non-instructional staff at $70,000 per year. Salary projections apply a 2 percent inflationary rate. A fringe rate of 36.50 percent for faculty and academic staff is utilized and incorporated into the expenses illustrated in this section.

The Ph.D. in Ecology and Evolutionary Biology program will provide five-year funding support guarantees to all incoming students. Typically, this support is in the form of graduate assistantships such as a project assistantship (PA) or research assistantship (RA) in a faculty member's lab but may also include teaching assistantships (TA). The assistantship appointments will be at the 33.3 percent level or higher and include tuition remission and eligibility for health insurance through the university. Project and research assistants will be funded from grants generated by faculty. Assistantship stipends are subject to a 22.5 percent fringe benefit rate. In some cases, students may be funded partially or completely through internal or external fellowships or traineeships. The guarantees are contingent on satisfactory progress and performance.

Facilities and Capital Equipment

The program will use existing facilities for instruction in the Department of Entomology and in collaborating units, which are operated and maintained through the department's budget. No additional expenses, facilities, or capital equipment are required for the program.

Other Expenses

Other expenses include tuition remissions for graduate students in Teaching Assistantship, Project Assistantship, or Research Assistantship positions.

Section VI – Net Revenue

The Ph.D. in Ecology and Evolutionary Biology is a traditional pooled tuition program that will be revenue-neutral. Tuition revenues from students in this program will be pooled at the institution level and used to support student instruction and services. This program is also funded by reallocating staff and faculty resources in the Department of Entomology. Graduate students have funding support via assistantships through faculty grant money and department GPR dollars. Overall, the program will be revenue-neutral.

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

Date: 17 January 2025

To: Jay O. Rothman, President, Universities of Wisconsin

CC: Johannes Britz, Interim Senior Vice President for Academic and Student Affairs
Tracy Davidson, Associate Vice President for Academic Affairs
Diane Treis, Director of Academic Programs and Student Learning Assessment

From: Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

Subject: Request for Authorization to Implement: PhD-Ecology and Evolutionary Biology

Submitted Via Email Only to: oaa@wisconsin.edu

In keeping with UW System and Board of Regents policy, I am sending you a Request for Authorization to Implement a new PhD-Ecology and Evolutionary Biology program at the University of Wisconsin–Madison.

The program is designed to meet UW–Madison's definition and standards of quality and will make a meaningful contribution to the university's mission, overall academic plan, and academic degree program array. There is university-wide support for the program, and all relevant and required governance bodies have completed their review processes. In addition, the necessary financial, capital, and human resources are in place and/or have been committed to implement and sustain the program. I thus send the proposal forward with broad university-wide support, governance approval, and my endorsement.

Contingent upon Board of Regents approval, the faculty plan to implement the new program in fall 2025 with first enrollments in the fall of 2025. We are requesting that this proposal be scheduled for consideration at the April 2025 Board of Regents meeting. Please contact Karen Mittelstadt (mittelstadt@wisc.edu) with any questions about these materials.

Attachments: Request for Authorization to Implement (Parts A and B), Cost and Revenue Projections, Cost and Revenue Projections Narrative

Copies:
Jennifer L. Mnookin, Chancellor, UW–Madison
Glenda Gillaspy, Dean and Director, College of Agricultural and Life Sciences
Jeri Barak, Associate Dean, College of Agricultural and Life Sciences
Megan Ackerman-Yost, Assistant Dean, College of Agricultural and Life Sciences
William Karpus, Dean, Graduate School
Jenna Alsteen, Assistant Dean, Graduate School
Rob Cramer, Vice Chancellor for Finance and Administration
David Murphy, Associate Vice Chancellor for Finance and Administration
Allison La Tarte, Vice Provost, Data, Academic Planning & Institutional Research
Karen Mittelstadt, Institutional Academic Planner, Data, Academic Planning & Institutional Research

Office of the Provost and Vice Chancellor for Academic Affairs
150 Bascom Hall University of Wisconsin-Madison 500 Lincoln Drive Madison, Wisconsin 53706
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Education Committee
April 16, 2025

Item C.7.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION)
MASTER OF SCIENCE IN QUANTITATIVE ECONOMICS
AT
UNIVERSITY OF WISCONSIN–MADISON

REQUESTED ACTION

Adoption of Resolution C.7., authorizing the implementation of the Master of Science in Quantitative Economics at the University of Wisconsin–Madison.

Resolution C.7. That, upon the recommendation of the Chancellor of the University of Wisconsin–Madison and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Master of Science in Quantitative Economics program at the University of Wisconsin–Madison.

SUMMARY

The University of Wisconsin (UW)-Madison proposes to establish a Master of Science (M.S.) in Quantitative Economics to be offered by the Department of Economics within the College of Letters & Science. The 30-credit M.S. in Quantitative Economics program will prepare students to enter careers requiring specialized expertise in applying modern machine learning and data analytic tools to analyze economic data. Students will be trained in an array of high-demand quantitative skills. The amount of economic data (e.g., sales and pricing) used by firms has risen sharply due to increased computing power and the ease of data collection. The M.S. in Quantitative Economics will train students to manage and analyze this proliferation of economic data.

Today, multinational technology companies have large and growing teams of quantitative economists. This growth has created new opportunities for economists who leverage their understanding of markets and economic incentives in emerging digital markets, coupled with experience distinguishing causal relationships from data. While demand for these new skills first emerged in the high-tech sector, greater availability of digitized data across businesses, governments, and nonprofits creates a widespread need for applied economists, who often work alongside data scientists with other backgrounds. The Bureau of Labor Statistics projects increased occupational growth for economists and substantial

occupational growth for data scientists, thus resulting in substantial demand for students educated in quantitative economics. Service-based pricing will apply.

Presenter

- Dr. Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting, available at https://www.wisconsin.edu/uw–policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

REQUEST FOR AUTHORIZATION TO IMPLEMENT A MASTER OF SCIENCE IN QUANTITATIVE ECONOMICS AT THE UNIVERSITY OF WISCONSIN-MADISON PREPARED BY UW-MADISON

ABSTRACT

The University of Wisconsin (UW)-Madison proposes to establish a Master of Science (M.S.) in Quantitative Economics to be offered by the Department of Economics within the College of Letters & Science. The 30-credit M.S. in Quantitative Economics program will prepare students to enter careers requiring specialized expertise in applying modern machine learning and data analytic tools to analyze economic data. Students will be trained in an array of high-demand quantitative skills. The amount of economic data (e.g., sales and pricing) used by firms has risen sharply due to increased computing power and the ease of data collection. The M.S. in Quantitative Economics will train students to manage and analyze this proliferation of economic data.

Today, multinational technology companies have large and growing teams of quantitative economists. This growth has created new opportunities for economists who leverage their understanding of markets and economic incentives in emerging digital markets, coupled with experience distinguishing causal relationships from data. While demand for these new skills first emerged in the high-tech sector, greater availability of digitized data across businesses, governments, and nonprofits creates a widespread need for applied economists, who often work alongside data scientists with other backgrounds. The Bureau of Labor Statistics projects increased occupational growth for economists and substantial occupational growth for data scientists, thus resulting in substantial demand for students educated in quantitative economics. Service-based pricing will apply.

PROGRAM IDENTIFICATION

University Name
University of Wisconsin-Madison

Title of Proposed Academic Program
Quantitative Economics

Degree Designation(s)
Master of Science (M.S.)

Proposed Classification of Instructional Program (CIP) Code
45.0603 Econometrics and Quantitative Economic

Mode of Delivery
Single university, in-person delivery

Department or Functional Equivalent
Department of Economics

College, School, or Functional Equivalent
College of Letters & Science

Proposed Date of Implementation
September 2025

PROGRAM INFORMATION

Overview of the Program

The proposed M.S. in Quantitative Economics will be a unique program targeting students who want to receive further training in the intersection of economics and data analytics. It will combine traditional economic training in microeconomics with practice-based courses designed to meet workforce demands from technology industries within the United States and internationally. The program will consist of 30 credits, including 21 credits of required courses and 9 credits of elective coursework. Required coursework completed by students in their first two semesters will establish a foundation in economics, econometrics, data manipulation, and machine learning ideas in economics. Required coursework completed in the third semester will integrate concepts taught in previous semesters with elective coursework and guide the practical analysis of economic data.

The M.S. in Quantitative Economics learning objectives have been tailored to provide students with a theoretical microeconomic framework for understanding the objectives of firms and the econometric training to apply the appropriate tools to solve problems, making maximum use of the available data. The Department of Economics will hire adjunct instructors who are currently working in industry to teach some of the program courses. These instructors will draw on their industry experience to create hands-on courses in which the students will gain exposure to the real-world experiences they will have in the workforce upon completing the degree.

Projected Enrollments and Graduates by Year Five

Table 1 represents enrollment and graduation projections for students entering the program over the next five years. In preparing these figures, the department considered the enrollment trends within its existing M.S. in Economics subplan/named option in Graduate Foundations. The Graduate Foundations subplan/option focuses on students interested in academic careers, while the proposed M.S. in Quantitative Economics is

designed for students who wish to practice across industries. Currently, the Graduate Foundations subplan/option enrolls an average cohort of 80 new students annually.

It is projected that by the end of the fifth year, 215 students will have enrolled in the program, and 162 students will have graduated. By Year 3, enrollment is expected to be sustained at 88 students annually. The average student retention rate is projected to be at least 95 percent, the retention rate for the Graduate Foundations subplan/option.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	35	45	45	45	45
Continuing Students	0	33	43	43	43
Total Enrollment	35	78	88	88	88
Graduating Students	0	33	43	43	43

Tuition Structure

The proposed program's tuition structure will apply service-based pricing principles as articulated in SYS 130: Programming for the Non-Traditional Market in the UW System. This program is designed for nontraditional students, specifically targeting those who want to receive further training in the intersection of economics and data analytics. The practically oriented curriculum will meet workforce demands and training needs of organizations within the technology industry in the United States and internationally. Furthermore, the flexibility of course offerings will enable students to complete the program in as few as three semesters. The tuition rate for students enrolled in the M.S. in Quantitative Economics will be $2,400 per credit for Wisconsin residents and nonresidents. The total cost will be $72,000 for the 30-credit program. The pricing structure was determined after extensive market research and is aimed at balancing tuition rates at peer institutions with expected program costs and revenue. Additional program or course fees are not anticipated.

Student Learning Outcomes and Program Objectives

The M.S. in Quantitative Economics program curriculum will support the following learning outcomes. Students will:

1. Demonstrate understanding of core principles of microeconomic theory.
2. Obtain a deep understanding of methods to perform causal analysis, evaluate the appropriateness of the methods given the economic question and available data, and interpret the limitations in inference when an ideal approach is available.
3. Clean and analyze economic data sets using modern statistical software and frontier econometric approaches.
4. Communicate results of analysis of economics data in precise yet clear manner.

Program Requirements and Curriculum

The M.S. in Quantitative Economics will be a 30-credit in-person program. The curriculum will be completed over three or four academic semesters. Table 2 illustrates the coursework that students will be required to complete.

Table 2: M.S. in Quantitative Economics Curriculum

Academic degree program or major course requirements:	
Economics 770 Data Analytics for Economists	3 credits
Economics 701 Micro Economics 1	3 credits
Economics 704 Econometrics 1	3 credits
Economics 707 Causal Estimation in Economics	3 credits
Economics 725 Machine Learning for Economics	3 credits
Economics 726 Applications of Machine Learning in Economics	3 credits
Economics 771 Advances in Artificial Intelligence for Economists	3 credits
Electives	9 credits
Total Credits	**30 credits**

Projected Time to Degree

The program is structured so students can complete the degree requirements in two academic years, though they can finish in three semesters. All necessary courses will be offered in sequence in three semesters to allow students to graduate at the end of the third semester.

Accreditation

The proposed M.S. in Quantitative Economics program is not subject to specialized or additional accreditation approvals. The program will be reported to the Higher Learning Commission according to their requirements.

PROGRAM JUSTIFICATION

Rationale

The impetus for proposing the new M.S. in Quantitative Economics program was initiated by students who expressed dissatisfaction with the M.S. in Economics subplan/option titled Graduate Foundations. The Graduate Foundations subplan/option was implemented in 2012 and intended to serve students pursuing advanced studies (i.e., enrolling in Ph.D. programs on economics) and those interested in immediate career application within relevant industry jobs. Department of Economics faculty and staff reviewed data and information collected through student conversations and via evaluation conducted through the regular academic program review processes. The department determined that the Graduate Foundations program serves students interested in careers in the academy very well but does not fully meet the needs of students intending to embark upon industry jobs. The feedback and analysis have shown that the courses

offered in the program are often too theoretical and not practical enough for students interested in industry jobs.

The proposed M.S. in Quantitative Economics will offer a distinct program of study for students interested in academic versus industry roles. The M.S. in Quantitative Economics has been designed for students interested in industry and technology jobs that require specialized expertise in modern machine learning and data analytic tools. The department has already created two new courses designed to address a more industry-minded student: Economics 725, Machine Learning for Economics, and Economics 770, Data Analytics for Economists. These are elective offerings in the Graduate Foundations subplan/option and have proven to be very popular. Many students pursuing graduate degrees in economics know their future career goals. If a student's career interests change, the department has structured the Graduate Foundations subplan/option and the proposed M.S. in Quantitative Economics programs so that students could transition between the two relatively early in the program.

Institution and Universities of Wisconsin Program Array

The suggested CIP for the proposed M.S. in Quantitative Economics is 45.0603 Econometrics and Quantitative Economics. UW-Madison and UW-Milwaukee are the only UW universities offering graduate programs in this specific CIP area. UW-Milwaukee offers an M.A. and Ph.D. in Economics. Milwaukee's M.A. in Economics is a broad program. Its curriculum is more comparable to the UW-Madison M.S. in Economics' Graduate Foundations subplan/option than the proposed M.S. in Quantitative Economics. UW-Milwaukee's master's program has three required core courses (i.e., micro, macro, and econometrics), giving students much latitude in designing their degree. By contrast, the proposed M.S. in Quantitative Economics will have seven required courses to achieve the core learning objectives, including courses specifically dedicated to economic analytics and machine learning. UW-Madison offers an M.S. and Ph.D. in Economics, an M.S. in Financial Economics, and a Ph.D. in Agricultural and Applied Economics.

Within UW-Madison, there are some linkages between the proposed M.S. in Quantitative Economics and existing programs, namely the M.S. and Ph.D. in Agricultural and Applied Economics, the M.S. and Ph.D. in Economics, and the M.S. in Financial Economics. The university's graduate programs in Agriculture and Applied Economics differ from the proposed new degree program as they are focused on coursework related to agriculture, environmental and natural resource economics, the economic development of low-income countries, agricultural economics, community economics, and resource and energy demand analysis. These concepts are not integrated into the proposed M.S. in Quantitative Economics. The M.S. in Economics offering and specifically the associated Graduate Foundations subplan/option has already been detailed within this proposal and motivated the creation of the new M.S. in Quantitative Economics to better target student interests. Finally, the M.S. in Financial Economics is jointly offered by the finance department within the School of Business and the Department of Economics and is

focused on the financial side of economics. Graduates of the M.S. in Financial Economics program are targeting Ph.D. degrees in business schools or careers within financial institutions, Federal Reserve Banks, Wall Street, etc.

Need as Suggested by Student Demand

Two approaches assessed student demand for the proposed M.S. in Quantitative Economics. The first is a report produced by the university's Division of Continuing Studies, which showed that while enrollment has been down in graduate-level economics programs across the country since the COVID-19 pandemic, programs focused on preparation for industry and technology roles have experienced steady or increasing enrollments. This industry preparation is the focus of the proposed M.S. in Quantitative Economics.

The Department of Economics also surveyed various stakeholders to evaluate student demand for the proposed M.S. in Quantitative Economics. Surveys were sent to undergraduate students at two different institutions in China, current students in the undergraduate and graduate programs within the Department of Economics, recent graduates from the university's economics programs, and students who were admitted into the existing M.S. in Economics Graduate Foundations subplan/option but did not enroll. The survey results show substantial demand for an industry-focused master's program in economics and great interest in the proposed coursework focusing on machine learning and data analytics. One finding of note revealed that 58 percent of the students admitted to the Graduate Foundations subplan/option but who did not enroll would have if the M.S. in Quantitative Economics program existed as an alternative.

Need as Suggested by Market Demand

The M.S. in Quantitative Economics program will be a unique program targeting students seeking further training in the intersection of economics and data analytics with an eye toward jobs in the technology and other industries. The expansion in data availability combined with increased computing power has created new opportunities for economists who can leverage their understanding of markets and economic incentives with experience distinguishing causal relationships from data. While demand for these new skills first emerged in the high-tech sector, greater availability of digitized data across businesses, governments, and non-profit organizations creates a widespread need for applied economists, often working alongside data scientists with other backgrounds. In economics, combining big data and new quantitative tools has already had a transformative effect on the range of work expected of economists in industry today. As a result, there is a large demand for data and quantitative degree programs in economics that equip students with the skills to thrive in these careers. Today, companies including Amazon, Google, Facebook, Microsoft, Airbnb, Uber, and Netflix all have large teams of quantitative economists and are continuously expanding.

The Bureau of Labor Statistics (BLS) identifies several close occupational categories, but none perfectly align with the market the M.S. in Quantitative Economics seeks to

serve.[1] The proposed degree program is designed for students interested in applying modern data science and analytics tools to study economics. While the BLS does not explicitly look at the combination of economics and data science, it does report them separately.[2] Occupational growth for economists is projected to be 5 percent from 2023 to 2033, while for data scientists, occupational growth is projected to be a stunning 36 percent over the decade. The median economist in the United States earns $115,730 annually, while the median data scientist earns $108,020 annually. The growth in the combination of economics and data science is expected to be closer to the growth for other types of data science than for broad economists. Economists use data and statistical techniques to research and analyze various fields, including finance, technology, education, and policy analysis. Typical jobs for graduates with a degree in economics include economist, data scientist, quantitative analyst, credit analyst, economic consultant, lecturer of economics, financial analyst, and data analyst. The biggest employers of economists are the federal government, management, scientific and technical consulting services, scientific research and development services, and local government.

[1] Bureau of Labor Statistics. (2023). *Economist Occupational Outlook Handbook*. https://www.bls.gov/ooh/life-physical-and-social-science/economists.htm

[2] Bureau of Labor Statistics. (2023). *Data Scientists Occupational Outlook Handbook*. https://www.bls.gov/ooh/math/data-scientists.htm

University of Wisconsin-Madison
Cost and Revenue Projections For MS-Quantitative Economics

	Items	Projections				
		2025	2026	2027	2028	2029
		Year 1	Year 2	Year 3	Year 4	Year 5
I	**Enrollment (New Student) Headcount**	35	45	45	45	45
	Enrollment (Continuing Student) Headcount	0	33	43	43	43
	Enrollment (New Student) FTE	35	45	45	45	45
	Enrollment (Continuing Student) FTE	0	33	43	43	43
II	**Existing Credit Hours**	525	1170	1320	1320	1320
III	**FTE of Faculty/Instructional Staff**	3	4	5	6	6
	FTE of Admin Staff	1	1.5	2	2	3
IV	**Revenues**					
	Tuition (based on $2,400/credit)	$1,260,000	$2,808,000	$3,168,000	$3,168,000	$3,168,000
	Total New Revenue	$1,260,000	$2,808,000	$3,168,000	$3,168,000	$3,168,000
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary ($180,000)	$180,000	$367,200	$374,544	$573,051	$584,514
	Instuctional Academic Staff ($115,000)	$230,000	$234,600	$239,292	$366,117	$373,440
	Administrative and Student Support Staff ($70,000)	$70,000	$107,100	$145,656	$148,568	$227,310
	Fringe (34.7%)	$166,560	$245,988	$263,544	$377,444	$411,287
	Other Expenses					
	Marketing	$25,000	$30,000	$36,000	$43,200	$51,840
	Events	$5,000	$7,500	$11,250	$16,875	$25,313
	Outreach	$5,000	$7,500	$11,250	$16,875	$25,313
	Technology	$10,000	$11,000	$12,100	$13,310	$14,641
	Scholarship Funding	$75,000	$90,000	$108,000	$129,600	$155,520
	UW-Madison Campus Charges	$126,000	$280,800	$316,800	$316,800	$316,800
	L&S Administrative Costs	$252,000	$561,600	$633,600	$633,600	$633,600
	Total Expenses	**$1,144,560**	**$1,943,288**	**$2,152,036**	**$2,635,440**	**$2,819,577**
	Net Revenue - Reinvestment Margin	**$115,440**	**$864,712**	**$1,015,964**	**$532,560**	**$348,423**

Provost's Signature: **Date:** 2/13/2025

Chief Business Officer's Signature: **Date:** 1/28/2025

COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN-MADISON
MASTER OF SCIENCE IN QUANTITATIVE ECONOMICS

PROGRAM INTRODUCTION

The University of Wisconsin (UW)-Madison proposes to establish a Master of Science (M.S.) in Quantitative Economics. This unique 30-credit program will target a specific group of nontraditional students who want to receive further training in the intersection of economics and data analytics. The practically oriented curriculum is designed to meet workforce demands and training needs of organizations within the technology and other industries in the United States and internationally. Furthermore, the flexibility of course offerings will enable students to complete the program in as few as three semesters. Consequently, the program will feature a service-based pricing tuition rate of $2,400 per credit hour in accordance with UW System Administrative Policy SYS 805: Tuition and Fee Policies for Credit Instruction and SYS 130: Programming for the Non-Traditional Market.

COST REVENUE NARRATIVE

Section I – Enrollment

The program is anticipated to begin enrolling students in the fall of 2025, with a projected enrollment of 35 new students in the first year, increasing to 45 new students per year each year through Year 5. Enrollment estimates are based on enrollment patterns in the existing M.S. in Economics program. For planning purposes, the program projects a retention rate of 95 percent. It is projected that by the end of the fifth year of the program, 215 students will have been enrolled, and 162 will have graduated.

Section II – Credit Hours

The M.S. in Quantitative Economics program requires 30 credits over three or four semesters. For planning purposes, budget projections are based on students completing nine credits in their first semester, six in the second, six in the third, and the final nine elective credits in the fourth semester. This is 15 credit hours per academic year. The program enrollment will generate approximately 525 credit hours in Year 1,170 by Year 2, leveling off at 1,320 credit hours per year in Years 3-5. Coursework is drawn from existing courses in the graduate-level economics programs.

Section III – Faculty and Staff Appointments

To implement this program administratively for the first year, expertise and a total of 1.0 FTE of administrative time will be provided by the program manager, academic program director, department administrator, department chair, and master's program

director. The academic teaching/research will be provided by a percentage of four current faculty and two lecturers, equating to 3.0 FTE in Year 1. To sustain the M.S. in Quantitative Economics program, a new program manager, one full-time faculty member, and a part-time industry expert lecturer will be hired in Years 2-3. The Department of Economics will utilize the expertise of two lecturers appointed in the past academic year. These individuals were identified with the needs of the M.S. in Quantitative Economics in mind. The Cost and Revenue Projection shows how existing and new FTE will be distributed as the M.S. in Quantitative Economics is implemented and grows.

Section IV – Program Revenues

The proposed M.S. in Quantitative Economics will operate on the tuition revenue generated by the credits taught in the degree program. With current projected tuition revenue and expenses, the program will be sustainable with the planned new and shared resources.

Tuition

Service-based tuition rates will apply for students enrolled in the M.S. in Quantitative Economics. The tuition rate per credit will be $2,400 for all students. No other fees will be assessed. The program's total cost for each student to earn the degree will be $72,000. This is calculated by multiplying the number of credits (30) by the rate for each credit ($2,400). With the initial estimated enrollment of 35 new students in the first-year cohort, the Year 1 revenue from tuition is projected to be $1,260,000. By Year 5, the revenue from tuition is projected to be $3,168,000.

The proposed program's tuition structure will apply service-based pricing principles as articulated in SYS 130: Programming for the Non-Traditional Market in the UW System. This program is designed for nontraditional students, specifically targeting those who want to receive further training in the intersection of economics and data analytics. The practically oriented curriculum will meet workforce demands and training needs of organizations within the technology industry in the United States and internationally. Furthermore, the flexibility of course offerings will enable students to complete the program in as few as three semesters.

Fees

There are no program or course fees.

Program Revenues and GPR

As illustrated in the Cost and Revenue Projections spreadsheet, the program will generate revenue to support itself starting in Year 1.

Section V – Program Expenses

Program expenses will include salary and fringe and other expenses such as annual scholarship funding, supplies, events, marketing, outreach, campus and college taxes, etc.

Salary and Fringe

Instructional and non-instructional expenses, including the salary and fringe of faculty, instructional staff, and other administrative staff, are projected to total $646,560 in Year 1. Salaries are projected to increase at a rate of two percent annually. All fringe benefits are 34.7 percent and applied to the total faculty and staff salary. By Year 5, the total expense for salaries plus fringe will be $1,596,551.

Facilities and Capital Equipment

No new costs are anticipated in this category. The current infrastructure within the Department of Economics is sufficient to serve the degree program.

Other Expenses

The cost and revenue projections detail other expenses associated with launching and sustaining the program, including program marketing, events, and outreach expenses. Costs also include expenses related to technology critical to the delivery of the curriculum. Finally, the projections account for scholarship awards. Funding for these awards will start at $75,000 and increase by 20 percent annually.

In addition, the College of Letters & Science takes 20 percent of the gross revenue to cover campus administrative costs, and the UW-Madison campus charges 10 percent of gross revenue to cover university expenses such as maintenance, building expenses, utilities, etc.

Section VI – Net Revenue

The revenue from the M.S. in Quantitative Economics program will be reinvested into other academic programs in the Department of Economics and into other programs within the College of Letters & Science. This will include additional funding for the Ph.D. program's need for additional support staff and the investment of resources into staff and faculty salaries and professional development.

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

Date: 20 February 2025

To: Jay O. Rothman, President, Universities of Wisconsin

CC: Johannes Britz, Interim Senior Vice President for Academic and Student Affairs
Tracy Davidson, Associate Vice President for Academic Affairs
Diane Treis, Director of Academic Programs and Student Learning Assessment

From: Charles Lee Isbell, Jr., Provost and Vice Chancellor for Academic Affairs

Subject: Request for Authorization to Implement: MS-Quantitative Economics

Submitted Via Email Only to: oaa@wisconsin.edu

In keeping with UW System and Board of Regents policy, I am sending you a Request for Authorization to Implement a new MS-Quantitative Economics program at the University of Wisconsin–Madison.

The program is designed to meet UW–Madison's definition and standards of quality and will make a meaningful contribution to the university's mission, overall academic plan, and academic degree program array. There is university-wide support for the program, and all relevant and required governance bodies have completed their review processes. In addition, the necessary financial, capital, and human resources are in place and/or have been committed to implement and sustain the program. I thus send the proposal forward with broad university-wide support, governance approval, and my endorsement.

Contingent upon Board of Regents approval, the faculty plan to implement the new program in fall 2025 with first enrollments in the fall of 2025. We are requesting that this proposal be scheduled for consideration at the June 2025 Board of Regents meeting. Please contact Karen Mittelstadt (mittelstadt@wisc.edu) with any questions about these materials.

Attachments: Request for Authorization to Implement (Parts A and B), Cost and Revenue Projections, Cost and Revenue Projections Narrative

Copies:
Jennifer L. Mnookin, Chancellor, UW–Madison
Eric Wilcots, Dean, College of Letters & Science
Elaine Klein, Associate Dean for Academic Planning, College of Letters & Science
Lori Kido Lopez, Associate Dean for Social Sciences, College of Letters & Science
William Karpus, Dean, Graduate School
Jenna Alsteen, Assistant Dean, Graduate School
Rob Cramer, Vice Chancellor for Finance and Administration
David Murphy, Associate Vice Chancellor for Finance and Administration
Allison La Tarte, Vice Provost, Data, Academic Planning & Institutional Research
Karen Mittelstadt, Institutional Academic Planner, Data, Academic Planning & Institutional Research

Office of the Provost and Vice Chancellor for Academic Affairs
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Education Committee
April 16, 2025

Item C.8.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION) MASTER OF SCIENCE IN EDUCATION IN ELEMENTARY MIDDLE EDUCATION, UNIVERSITY OF WISCONSIN-WHITEWATER

REQUESTED ACTION

Adoption of Resolution C.8., authorizing the implementation of the Master of Science in Education in Elementary Middle Education at the University of Wisconsin-Whitewater.

Resolution C.8. That, upon the recommendation of the Chancellor of the University of Wisconsin-Whitewater and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Master of Science in Education in Elementary Middle Education program at the University of Wisconsin-Whitewater.

SUMMARY

The University of Wisconsin (UW)-Whitewater proposes to establish a Master of Science in Education (MSE) in Elementary Middle Education. This program offers a graduate pathway for individuals who already hold a bachelor's degree and wish to pursue a career in teaching. Aligned with the university's mission and strategic goals, this program aims to address critical teacher shortages in Wisconsin by providing a flexible, online option that qualifies students to work as classroom teachers in grades kindergarten to ninth grade for Wisconsin Department of Public Instruction (DPI) licensure. The 32-credit program is designed to accommodate both recent graduates and professionals seeking to enter the education field or broaden their teaching qualifications.

The MSE in Elementary Middle Education will be offered through service-based graduate tuition and responds directly to the market demand for qualified teachers, particularly in districts facing staffing challenges. The demand for this program is reinforced by the growing number of K-9 teachers working under emergency licenses, as well as survey data from school district administrators highlighting the need for more flexible, post-baccalaureate teacher preparation programs.

The 32-credit program is designed as a two-year program. The majority of students are expected to attend part time for 5 consecutive terms, including summer. Students may complete the coursework online around their existing work schedules, and they may work as teachers on emergency licenses throughout their course of study. This program offers a practical solution for working adults seeking to change careers while addressing statewide hiring shortages in key areas of K-9 education.

Presenter

- Dr. Robin Fox, Interim Provost and Vice Chancellor for Academic Affairs

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting (Revised August 2023), available at https://www.wisconsin.edu/uw-policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

REQUEST FOR AUTHORIZATION TO IMPLEMENT A MASTER OF SCIENCE IN EDUCATION IN ELEMENTARY MIDDLE EDUCATION AT UNIVERSITY OF WISCONSIN-WHITEWATER PREPARED BY UW-WHITEWATER

ABSTRACT

The University of Wisconsin (UW)-Whitewater proposes to establish a Master of Science in Education (MSE) in Elementary Middle Education. This program offers a graduate pathway for individuals who already hold a bachelor's degree and wish to pursue a career in teaching. Aligned with the university's mission and strategic goals, this program aims to address critical teacher shortages in Wisconsin by providing a flexible, online option that qualifies students to work as classroom teachers in grades kindergarten to ninth grade for Wisconsin Department of Public Instruction (DPI) licensure. The 32-credit program is designed to accommodate both recent graduates and professionals seeking to enter the education field or broaden their teaching qualifications.

The MSE in Elementary Middle Education will be offered through service-based graduate tuition and responds directly to the market demand for qualified teachers, particularly in districts facing staffing challenges. The demand for this program is reinforced by the growing number of K-9 teachers working under emergency licenses, as well as survey data from school district administrators highlighting the need for more flexible, post-baccalaureate teacher preparation programs.

The 32-credit program is designed as a two-year program. The majority of students are expected to attend part time for five consecutive terms, including summer. Students may complete the coursework online around their existing work schedules, and they may work as teachers on emergency licenses throughout their course of study. This program offers a practical solution for working adults seeking to change careers while addressing statewide hiring shortages in key areas of K-9 education.

PROGRAM IDENTIFICATION

University Name
University of Wisconsin-Whitewater

Title of Proposed Academic Program
Elementary Middle Education

Degree Designation(s)
Master of Science in Education

Suggested Classification of Instructional Programs (CIP) Code
13.1202 Elementary Education and Teaching

Mode of Delivery
Single university; fully distance education

Department or Functional Equivalent
Department of Curriculum and Instruction

College, School, or Functional Equivalent
College of Education and Professional Studies

Proposed Date of Authorization
April 2025

Proposed Date of Implementation
Fall 2025

PROGRAM INFORMATION

Overview of the Program

This proposed 32-credit program integrates coursework and clinical preparation in K-12 school settings to offer students the skills and experiences needed to thrive in the teaching profession, increasing their retention in the field. The asynchronous online coursework focuses on foundational teaching components such as the skills needed to build active and motivated learning environments, planning and strategies for instruction, assessment, and content knowledge. The program includes a strong focus on evidence-based reading instruction, where reading coursework meets Act 20 requirements, preparing students to pass the statutorily required Foundations of Reading Test. The program requires two clinical experiences before a full-semester student teaching placement in elementary/middle schools. These placements, organized by the college's Office of Clinical Experiences, can be completed in the student's area of residence. During these clinical placements, students will progress from observers to teachers with full instructional and professional responsibilities, receiving support and continual feedback from school-based cooperating teachers and university supervisors.

Projected Enrollments and Graduates by Year Five

Table 1 represents enrollment and graduation projections for students entering the program over the next five years.

Enrollment projections are supported by enrollments in current programs, the volume of requests for a post-baccalaureate licensure program, and market need as evidenced by area district administrators and Wisconsin Department of Public Instruction reports.[1] By year five of the program, we anticipate a recruitment rate of 25 new students per year, which is predicted to be our maximum enrollment for the program.

The 32-credit program is designed as a two-year program. The majority of students are expected to complete 6 credits each semester for 5 consecutive terms, including summer. Students may complete the coursework online around their existing work schedules, and they may work as teachers on emergency licenses throughout their course of study.

The retention rate from year 1 to year 2 is projected to be 90% based on the retention rates within the School of Graduate Studies at UW-Whitewater. Given the recruitment and enrollment plan, we anticipate that 87 students will have enrolled in the program, with 56 students graduating and being endorsed for licensure by the end of year 5.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	10	14	17	21	25
Continuing Students	0	9	13	15	19
Total Enrollment	10	23	30	36	44
Graduating Students	0	9	13	15	19

Tuition Structure

The proposed tuition structure for the M.S.E. in Elementary Middle Education will be based on service-based pricing principles for distance education, as articulated in SYS 130: Programming for the Non-Traditional Market in the UW System. This is because the M.S.E. in Elementary Middle Education is designed to meet the needs of students who balance work and the pursuit of their graduate degree. As a fully distance education program, students will be provided with flexible course delivery to meet their scheduling needs. We anticipate the service-based pricing rate will be $595 per credit upon Board of Regents approval. As such, we built the program budget accordingly. Students will need to purchase

[1] Wisconsin Department of Public Instruction, 2022 Educator Preparation Program and Workforce Analysis Report, published April 2024, https://dpi.wi.gov/sites/default/files/imce/education-workforce/pdf/2022-wi-epp-workforce-annual-report.pdf

textbooks for courses at an estimated $150 per course. No additional course fees will be applicable.

Student Learning and Program Outcomes

Student learning outcomes are developed in alignment with professional standards developed by the Council for the Accreditation of Educator Preparation (CAEP) and Association for Middle Level Education (AMLE). By graduation from this program, teacher candidates will be able to:

1. Use their understanding of learning development and learning differences to enable each learner to meet high standards.
2. Apply content knowledge for teaching different subject areas.
3. Use multiple methods of assessment to monitor learning and guide instruction.
4. Employ a variety of effective instructional strategies to meet the learning needs of all students.
5. Engage in practices, behaviors, and professional learning that develops their competence as professionals.

By mastering program level student learning outcomes, graduates will be prepared to be teachers with effective and empirically supported instruction. Students will graduate with strong classroom management skills and be proficient in the core content areas of English, mathematics, social science, and science. Completers will also be prepared as informed and skilled reading teachers due to the program's focus on reading instruction and intervention. Graduating students will be prepared to take and pass the Wisconsin Foundations of Reading Test, and the standardized test for elementary-middle education as determined by the state superintendent (currently Praxis II).

Program Curriculum

The admission requirements for the MSE Elementary Middle Education are the same as other graduate programs in the College of Education and Professional Studies. Students must have a baccalaureate or higher degree from a regionally accredited institution with a cumulative GPA of at least 2.75. There are no test scores required for admission to the program.

Table 2 illustrates the program curriculum for the proposed program. The program requirements are 32 credits, all of which are required to complete the Wisconsin Elementary/Middle Education (K-9) Teacher (2088) license requirements, including 6 credits on empirically based reading instruction, and 5 credits of school-based pre- and student teaching clinical experiences. The program may be completed as a two-year online program with clinical experiences within the second year, or as an intensive one-year (including two summers) residency program, where students are placed as full-time

teacher residents within K-12 schools for the academic year, wherein the coursework is designed to mirror and support their school experiences.

Table 2: MSE in Elementary Middle Education Program Curriculum

Course requirements:	
ELEMMID 710 Advanced Strategies for Teaching Mathematics	3 credit(s)
ELEMMID 715 Pre-Student Teaching Seminar	1 credit(s)
ELEMMID 718 Social Studies and Fine Arts Integration in the Classroom	3 credit(s)
ELEMMID 719 Student Teaching Seminar	1 credit(s)
ELEMMID 724 Advanced Strategies for Teaching Science	3 credit(s)
ELEMMID 762 Introduction to Equity and Technology Integration	3 credit(s)
ELEMMID 765 Theory and Practice of Working with Multilingual Students	3 credit(s)
READING 764 Foundations of Reading	3 credit(s)
READING 765 Literacy Instruction and Assessment in the Elementary/Middle Grades	3 credit(s)
ELEMMID 722 Teaching Climate Change & Natural Resources	1 credit(s)
SPECED 760 Disabilities: Characteristics & Eligibility for Special Education	3 credit(s)
CIFLD 726 Pre-Student Teaching, Elementary and Middle Levels	1 credit(s)
CIFLD 727 Student Teaching, Elementary and Middle Level	4 credit(s)
Total Credits	**32 credit(s)**

Projected Time to Degree

The 32-credit program is designed as a two-year program. The majority of students are expected to complete 6 credits each semester over 5 semesters including summer. Students may complete the coursework online around their existing work schedules, and they may work as teachers on emergency licenses throughout their course of study. As noted in Table 1, we anticipate 56 students will have graduated from the program and been endorsed for a Wisconsin K-9 Teacher License by the end of year 5.

Accreditation

The program will participate in UW-Whitewater's Higher Learning Commission (HLC) accreditation process, and no additional HLC approvals will be required. The elementary/middle (K-9) licensure proposal is under review for approval by the Wisconsin Department of Public Instruction (DPI).

JUSTIFICATION

Rationale

The demand for elementary and middle school teachers in Wisconsin remains high and K-9 regular education is currently the largest shortage area for licensed teachers in

Wisconsin.[2] In response to the growing need for well-prepared educators, UW-Whitewater proposes an online MSE in Elementary Middle Education, designed to provide flexible, high-quality preparation for post-baccalaureate students who do not have undergraduate major in education but would like to seek initial elementary-middle (K9) education licensure. The program is also designed to meet the needs of current teachers looking to broaden their qualifications to teach across all elementary and middle school core areas.

The proposed program is grounded in research, professional standards, and the Department of Public Instruction (DPI) requirements, ensuring that students gain both content knowledge and pedagogical expertise.[3] The curriculum is designed to be practical and transformative, equipping students to work effectively with diverse learners and create equitable, inclusive learning environments. In addition to coursework in core subject areas, the program includes multiple clinical experiences in various school settings, providing students with hands-on, reflective teaching practice that prepares them to thrive in dynamic educational environments.

Over the past two years, UW-Whitewater has received over 60 inquiries from post-baccalaureate students interested in a K-9 licensure program, with a significant majority expressing a preference for an online format and graduate degree attainment. The proposed program will be delivered asynchronously online, enabling students to complete coursework at their own pace over five semesters (approximately two years). The program's flexible structure will accommodate a wide variety of students including working adults, emergency licensed teachers, individuals with family responsibilities, and those unable to attend on-campus or hybrid classes.

The program's focus on accessibility and flexibility aligns with UW-Whitewater's Academic Plan, which includes career-focused education for nontraditional students as a priority.[4] The DPI has recognized both the shortage of online elementary-middle education programs in Wisconsin and the strong demand for this type of offering, further supporting the need for this initiative. In fact, the DPI's 2023 Educator Preparation Program and Workforce Analysis Report (released in March 2025) stated that K-9 regular education is the

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[2] Wisconsin Department of Public Instruction, 2023 Educator Preparation Program and Workforce Analysis Report, published February 2025, https://dpi.wi.gov/sites/default/files/imce/education-workforce/pdf/2023-wi-epp-workforce-annual-report.pdf

[3] Council for the Accreditation of Educator Preparation, CAEP 2018 K-6 Elementary Teacher Preparation Standards, updated August 2021, https://caepnet.org/~/media/Files/caep/standards/2018-caep-k-6-elementary-teacher-prepara.pdf?la=en

[4] University of Wisconsin-Whitewater, 2022 Five-Year Academic Program Array Plan, published October 2022, https://www.uww.edu/documents/acadaff/UWW%202022%20Academic%20Plan%20Approved%20%28003%29.pdf

largest shortage area for licensure across the state.[5] By delivering this program online, UW-Whitewater can expand access to a more diverse pool of students and help address the critical demand for qualified teachers in the state.

Institution and Universities of Wisconsin Program Array

The proposed program builds on the expertise built in UW-Whitewater's well-established Bachelor of Science in Education (BSE) Elementary Middle Education program, which is the campus's largest teacher preparation program. The MSE Elementary Middle Education program will provide a graduate option for teacher candidates who already hold a bachelor's degree. Requirements for Wisconsin's K-9 regular education teacher license are embedded within the program. This versatile license is often sought by practicing teachers who are looking to change positions or by those working in school districts that require teachers to cover multiple subject areas. As such, the proposed program complements the array of undergraduate teacher preparation programs offered at UW-Whitewater.

According to educator preparation program information by the Wisconsin Department of Public Instruction, all but one UW university, UW-Stout, offers teacher licensure preparation for Elementary/Middle Education, K-9, as part of one or more undergraduate, post-baccalaureate, or graduate credentials.[6] UW-Eau Claire, UW-Madison, UW-Oshkosh, UW-Superior, and UW-Whitewater offer preparation at the bachelor's level. According to the Universities of Wisconsin Academic Degree Program Array dashboard, all universities are authorized to offer master's level programs in at least one of the Classification of Instructional Programs areas of 13.01: Education, General; 13.03: Curriculum and Instruction; and 13.12 Teacher Education and Professional Development, Specific Levels and Methods. All but one university, UW-Platteville, are accepting new admissions in their programs. The proposed program is most similar to those at UW-River Falls and UW-Stevens Point that lead to master's programs in elementary education with initial licensing and are offered as a hybrid program and online modalities, respectively.

Need as Suggested by Current Student Demand

A useful measure of student demand for educator preparation programs is the number of Wisconsin school teachers who are currently working on emergency licenses, which occurs when school districts hire staff who are not licensed for their respective positions due to shortages in the teacher pipeline. School district teachers working on emergency licenses are required to complete their licensing requirements (therefore

[5] Wisconsin Department of Public Instruction, 2023 Educator Preparation Program and Workforce Analysis Report, published February 2025, https://dpi.wi.gov/sites/default/files/imce/education-workforce/pdf/2023-wi-epp-workforce-annual-report.pdf

[6] Wisconsin Department of Public Instruction, Leading Forward: Educator Preparation Programs, updated February 2025, https://dpi.wi.gov/education-workforce/prepare/educator-preparation-programs

needing to complete an educator preparation program). According to the most recent available data on emergency licenses issued by the DPI, there was a large increase in emergency licenses from 2019-20 to 2022-23 for Elementary and Middle (ELEMMID) Education.[7] Specifically, ELEMMID Education rose by 405 licenses to a total of 911 licenses with stipulations, representing 26.4% of the total emergency increase.[8] The rise in emergency licenses in ELEMMID education suggests that a growing number of teachers are entering classrooms before they meet the licensure requirements and thus are needing a post-baccalaureate educator preparation program to complete.

Another recruitment pool for this program is teachers who are currently qualified to only teach one subject, working in districts that need teacher flexibility. For example, since the K-9 license qualifies teachers across the core subject areas, earning this degree and additional licensure area provides flexibility to the teacher and their school district. UW-Whitewater's College of Education and Professional Studies surveyed area principals during spring 2023 and spring 2024 to better understand the need for graduate programs and district support for continuing education. Over 100 responses were received in each survey (108 in 2023, and 137 in 2024), and results indicated that nearly half (45% in 2023, 41% in 2024) of area schools offer salary increases to those who gain additional degrees. More than one third of the remaining districts are unable to provide salary increases for additional degrees, although they reported offering opportunities for advancement to those who gain additional degrees; and an additional quarter of districts provide support to employees seeking continuing education.

The approval of this new academic degree program will not affect existing enrollments/demand for related programs. Our existing Elementary Middle Education program is a four-year undergraduate program that offers primarily face-to-face classes to traditional undergraduates, who would like to receive their initial educator license. By contrast, the new program serves the needs of nontraditional students who have already received their bachelor's degree and would like to receive their initial licensure or additional licensure. Further, the new program is a graduate level online program that can better accommodate the needs of nontraditional students and offers more scheduling flexibility for those who need it.

Need as Suggested by Market Demand

A 2023 survey conducted by the Wisconsin Department of Public Instruction revealed that 84% of participating districts reported vacancies at the elementary level, and

[7] Wisconsin Policy Forum, In Case of Emergency: More Schools Turn to Short-Term Licenses, published March 2023, https://wispolicyforum.org/wp-content/uploads/2023/03/Focus_23_06_TeacherLicenses.pdf

[8] Wisconsin Department of Public Instruction, 2023 Educator Preparation Program and Workforce Analysis Report, February 2025, https://dpi.wi.gov/sites/default/files/imce/education-workforce/pdf/2023-wi-epp-workforce-annual-report.pdf, 35

75% reported vacancies at the middle school level.[9] Among these districts, 18.8% identified elementary teachers as one of their top five licensure shortage areas. District administrators commonly rely on substitutes, emergency-licensed teachers, or underqualified candidates due to the lack of applicants for open positions.

The most recent Educator Preparation Program and Workforce Analysis Report from the Wisconsin DPI highlights that the state's primary workforce challenge is teacher retention.[10] While sufficient numbers of teachers are being prepared compared to those retiring, only 55.6% of new teachers remain employed in the state after six years. This retention issue suggests that traditional education students are not being retained, pointing to the need for alternative pathways, such as this proposed program, to attract individuals seeking second careers in education. Candidates in this online graduate program are likely to be working as teachers on emergency licenses as they progress. Their experience in the classroom in combination with opportunities this program provides to connect theory to practice is expected to increase the likelihood that these candidates will be retained by districts within their first few years of employment.

In spring 2024, UW-Whitewater's College of Education and Professional Studies conducted a survey of 77 southern Wisconsin school administrators to identify emerging needs. Of the respondents, 27% expressed strong interest in a Master of Science in Education in Elementary/Middle Education (ELEMMID) with an elementary/middle (K-9) license. The same administrators indicated a preference for online master's programs over additional licensure opportunities.

A follow-up survey of 46 area administrators during summer 2024 revealed that 61% are experiencing challenges hiring sufficient teachers for positions covered by the K-9 license. They cited low numbers of applicants for vacant positions, especially in core subjects like literacy and reading. Nearly all respondents (94%) indicated there is likely a pool of candidates with undergraduate degrees who would be interested in a flexible online or hybrid K-9 licensure program, especially one they could complete while working full-time in area schools.

At the national level, the U.S. Bureau of Labor Statistics shows that both elementary and middle school teacher positions have an average employment growth rate of 6% between 2014 and 2024.[11] At the state level, the employment projection data provided by Wisconsin Department of Workforce Development shows a projection of 4.6% increase for

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[9] Wisconsin Department of Public Instruction, 2022 Educator Preparation Program and Workforce Analysis Report, 29.

[10] Wisconsin Department of Public Instruction, Leading Forward: Educator Preparation Programs, updated February 2025, https://dpi.wi.gov/education-workforce/prepare/educator-preparation-programs

[11] Vilorio, Dennis, Teaching for a living, published June 2016, https://www.bls.gov/careeroutlook/2016/article/education-jobs-teaching-for-a-living.htm

elementary school teachers from 2022 to 2032 with average annual openings of 1,454 in Wisconsin; and it also shows a projection of 4.7% increase for middle school teachers from 2022 to 2032 with average annual openings of 721 in Wisconsin.[12] In summary, both national and state data predict a steady increase in employment trends for both elementary and middle school teachers.

[12] State of Wisconsin Department of Workforce Development, Occupation Projections, 2024, https://jobcenterofwisconsin.com/wisconomy/pub/occupation

University of Wisconsin - Whitewater Cost and Revenue Projections For MSE Elementary Middle Education						
	Items	**Projections**				
		2025	**2026**	**2027**	**2028**	**2029**
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
I	**Enrollment (New Student) Headcount**	10	14	17	21	25
	Enrollment (Continuing Student) Headcount	0	9	13	15	19
	Enrollment (New Student) FTE	6.6	9.24	11.22	13.86	16.5
	Enrollment (Continuing Student) FTE	0	7.02	10.14	11.7	14.82
II	**Total New Credit Hours**	180	252	306	378	450
	Existing Credit Hours	0	126	182	210	266
III	**FTE of New Faculty/Instructional Staff**	0	0	0	0	0
	FTE of Current Fac/IAS	0.5	1.25	1.25	1.25	1.25
	FTE of New Admin Staff	0	0	0	0	0
	FTE Current Admin Staff	0.125	0.125	0.125	0.125	0.125
IV	**Revenues**					
	Tuition	$107,100	$224,910	$290,360	$349,860	$426,020
	Fees (indicate type)	$0	$0	$0	$0	$0
	Program Revenue (Grants)	$0	$0	$0	$0	$0
	Program Revenue - Other	$0	$0	$0	$0	$0
	GPR (re)allocation	$0	$0	$0	$0	$0
	Total Revenue	**$107,100**	**$224,910**	**$290,360**	**$349,860**	**$426,020**
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary	$43,125	$94,875	$94,875	$94,875	$94,875
	Instuctional Academic Staff	$11,400	$11,400	$11,400	$11,400	$11,400
	Administrative and Student Support Staff	$3,000	$3,000	$3,000	$3,000	$3,000
	Other Staff	$0	$0	$0	$0	$0
	Fringe Faculty and Academic Staff	$21,687	$41,197	$41,197	$41,197	$41,197
	Fringe University Staff	$0	$0	$0	$0	$0
	Fringe Other Staff	$0	$0	$0	$0	$0
	Facilities and Capital Equipment					
	University buildings and space	$0	$0	$0	$0	$0
	Capital Equipment	$0	$0	$0	$0	$0
	Operations	$0	$0	$0	$0	$0
	Other Expenses					
	Marketing	$10,000	$10,000	$10,000	$10,000	$10,000
	Total Expenses	**$89,212**	**$160,472**	**$160,472**	**$160,472**	**$160,472**
	Net Revenue	**$17,888**	**$64,438**	**$129,888**	**$189,388**	**$265,548**

Provost's Signature: **Date:**

John D. Chenoweth

1/21/2025

Chief Business Officer's Signature: **Date: 01/21/2025**

Brenda L Ames

1/21/2025

COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN-WHITEWATER
MASTER OF SCIENCE IN EDUCATION IN ELEMENTARY MIDDLE EDUCATION

PROGRAM INTRODUCTION

The University of Wisconsin (UW)-Whitewater proposes to establish a Master of Science in Education (MSE) in Elementary Middle Education. This program offers a graduate pathway for individuals who already hold a bachelor's degree and wish to pursue a career in teaching. Aligned with the university's strategic goals, this program aims to address critical teacher shortages in Wisconsin by providing a flexible, online option that qualifies students to work as classroom teachers in grades kindergarten to ninth grade for Wisconsin Department of Public Instruction (DPI) licensure. The 32-credit program is designed to accommodate both recent graduates and professionals seeking to enter or advance in the education field.

The MSE in Elementary Middle Education will be offered through service-based graduate tuition and responds directly to the market demand for qualified teachers, particularly in districts facing staffing challenges. The demand for this program is reinforced by the growing number of K-9 teachers working under emergency licenses, as well as survey data from school district administrators highlighting the need for more flexible, post-baccalaureate teacher preparation programs. This program offers a practical solution for working adults seeking to change or enhance their careers while addressing statewide hiring shortages in key areas of K-9 education.

COST REVENUE NARRATIVE

Section I – Enrollment

Student headcount reflects anticipated new student enrollment based on enrollment in UW-Whitewater's undergraduate Elementary Middle Education program, the volume of requests from prospective students for a graduate licensure program in this area, state and national trends including the number of emergency licenses in this area, and the accessibility created by offering the program fully online.

As we intend to implement quickly after authorization, we anticipate 10 new students enrolled in the first year, and consistent growth in each of the next four years until the program reaches 25 students, where it will stabilize. By the end of Year 5, it is expected that 87 students will have enrolled in the program and 56 will have graduated. In

years 2-5, continuing students are those enrolled as new students in the prior years but haven't completed the degree. The student retention rate is projected to be 90% based on the retention rates within the School of Graduate Studies at UW-Whitewater.

Given that the program is designed for working professionals, most students are expected to pursue the degree on a part-time basis during the academic year and summer sessions. In their first year, students are anticipated to enroll in 6 credits each during the fall, spring, and summer semesters. The typical coursework progression would have students complete 8 credits in the fall and 6 credits in the spring of their second year, allowing them to finish the program by May of that year. Based on the enrollment during the academic year, we project a full-time equivalent (FTE) of 0.66 during a student's first academic year and 0.78 during their second academic year, with 18 credits per year constituting full-time status under the UW-Whitewater School of Graduate Studies.

Section II – Credit Hours

The MSE Elementary Middle Education program requires 32 credits. In the first year, new students take 18 credit hours. In the second year, continuing students would take 14 credits in order to complete their degree by the end of the spring semester.

Section III – Faculty and Staff Appointments

The proposed MSE Elementary Middle Education program will be offered by UW-Whitewater's Department of Curriculum and Instruction in partnership with our Department of Special Education. Faculty who are currently teaching the reading and special education courses for other UW-Whitewater programs will continue to teach in the first year of the new program, and new sections of those courses will be necessary starting year 2. We will offer 4 new course sections (12 credits) in the first year, and 13 courses (32 credits) every following year on a self-supporting basis.

Current full-time and adjunct faculty will teach all of the courses (0.50 FTE in year one and 1.25 FTE in years 2-5). Faculty in UW-Whitewater's College of Education and Professional Studies typically teach four courses per semester.

A faculty coordinator is required to administer the program (market, recruit, and admit students, advise students, etc.). The faculty coordinator will receive a one-course reassignment per year (0.125 FTE) and a summer stipend of $3,000 to meet all academic admissions and advisement obligations.

Section IV – Program Revenues

<u>Tuition</u>

The proposed program is fully online, will target working professionals and is expected to attract participants from out-of-state with a market-based tuition level.

Therefore, the program will apply for a service-based pricing rate. The service-based pricing tuition estimate for the proposed program is $595 per credit hour.

Fees and Program Revenues

There are no other anticipated program revenue streams expected for this program as there will not be any fees accessible to the program expenses beyond the tuition.

Section V – Program Expenses

Salary and Fringe

Faculty and part time instructors are in place to teach the courses and provide supervision in the proposed program. New FTE attributable to the program are included in the salary and fringe estimates. As detailed in Section III, current faculty/instruction is calculated at .5 FTE during year 1, and 1.25 FTE during years 2-5. In addition, the program will require 0.125 FTE for administrative staff/program coordination, which is experienced as a 1-course annual teaching reassignment. The program coordinator will also receive a $3,000 stipend during summer sessions to process summer admissions and marketing. Salary expenses are calculated using average salaries for staff already in place. Compensation for summer instruction is included under salary for instructional academic staff and occurs on a course-by-course basis, where instructors receive $5,700 for each 3-credit course. The program requires 2 summer courses (6 credits) per year. Fringe is included based off a 37.7% rate for faculty and academic staff.

Facilities and Capital Equipment

The program will benefit from the anticipated Winther/Heide Hall renovations; however, the program does not require any specific new construction or facility investments. Therefore, no expenses are attributed to the program.

Other Expenses

The Department of Curriculum and Instruction receives sufficient library resources from the College of Education and Professional Studies to support the program.

Program marketing will be an additional expense. UW-Whitewater intends to commit $10,000 per year to market this proposed program. There are no other anticipated material expenses associated with the proposed program.

Section VI – Net Revenue

Net revenues will be invested in support of program and faculty development, and the general support of the College of Education and Professional studies and the University of Wisconsin-Whitewater. The support includes course delivery, instructional design, program marketing, and other items captured in the budget. Additionally, net revenues

may be used to invest in other new programs and/or to offer more graduate assistantships.

UNIVERSITY OF WISCONSIN
WHITEWATER

Office of the Provost

January 22, 2025

Jay Rothman
President, UW System
1720 Van Hise Hall
1220 Linden Drive
Madison, WI 53706

Dear President Rothman,

Please accept UW-Whitewater's Letter of Commitment for our new Master of Education Science (M.S.E.) program in Elementary Middle Education. The University of Wisconsin (UW)-Whitewater is proposing to establish a Master of Science in Education (M.S.E.) in Elementary Middle Education. This program expands on the existing Bachelor of Science in Education (BSE) Elementary Middle Education program by offering a graduate pathway for individuals who already hold a bachelor's degree and wish to pursue a career in teaching. Aligned with the university's strategic goals, this program aims to address critical teacher shortages in Wisconsin by providing a flexible, online option that qualifies students to work as classroom teachers in grades kindergarten to ninth grade through for Wisconsin Department of Public Instruction (DPI) licensure.

With this letter, I assert and make a firm commitment to the following:

1. The M.S.E. in Elementary Middle Education has been designed to meet the UW-Whitewater's definition and standards of quality and will contribute to our mission, overall academic plan, and academic degree program array. The program was developed in response to student and market demand.

2. There is university-wide support for the program, through every phase of our university governance processes. The proposal was approved by the Department of Curriculum and Instruction, the College of Education and Professional Studies Curriculum Committee, the Dean of the College of Education and Professional Studies, and the UW-Whitewater Graduate Council. All required approvals have been obtained on campus with enthusiastic support.

3. The necessary financial, capital, and human resources are in place and/or have been committed to implement and sustain the master's program. Department and college staff have thoroughly considered and planned for all of the resources needed to launch and maintain the program. A financial plan is in place to support and sustain the program.

The proposal for the new M.S.E. in Elementary Middle Education was developed using a very thorough and careful process. We have all of the necessary resources in place or firmly planned, and I am confident this program will be a success. The program will be a positive addition for UW-Whitewater, an attractive offering for students, and a benefit for workforce development in Wisconsin and the surrounding region. I am proud to recommend this new program for your approval and approval by the members of the Board of Regents. I believe this is a strong and needed addition to the University of Wisconsin System program array.

Sincerely,

John Chenoweth
Provost and Vice Chancellor for Academic Affairs

cc: Johannes Britz, Vice President of Academic Affairs and Student Affairs
Tracy Davidson, Associate Vice President of Academic Affairs
Corey King, Chancellor
Kristin Plessel, Associate Vice Chancellor for Academic Affairs
Lana Collet-Klingenberg, Dean, College of Education and Professional Studies
Matt Vick, Dean, School of Graduate Studies

Education Committee
April 16, 2025

Item C.9.

NEW PROGRAM AUTHORIZATION (IMPLEMENTATION)
BACHELOR OF SCIENCE IN
MEDICAL SCIENCES
UNIVERSITY OF WISCONSIN–WHITEWATER

REQUESTED ACTION

Adoption of Resolution C.9., authorizing the implementation of the Bachelor of Science in Medical Sciences at the University of Wisconsin–Whitewater.

Resolution C.9. That, upon the recommendation of the Chancellor of the University of Wisconsin–Whitewater and the President of the University of Wisconsin System, the Chancellor is authorized to implement the Bachelor of Science in Medical Sciences program at the University of Wisconsin–Whitewater.

SUMMARY

The University of Wisconsin-Whitewater proposes to establish a Bachelor of Science (B.S.) in Medical Sciences. The program will offer a new area of growth in UW-Whitewater's program array at the baccalaureate level. In partnership with local partner Mercyhealth, the B.S. in Medical Sciences aims to address the increasing need for skilled workers in healthcare. In response to those needs, two emphases are being proposed in the program, one in radiologic technology and the other in diagnostic sonography. The program is comprised of 125-126 credits. After completing a 60-credit Associate of Arts and Sciences degree, students will be required to complete an additional 65-66 credits. Graduates will be prepared for various careers, such as Radiologic Technologists, MRI Technologists, Diagnostic Medical Sonographers, and specialists in fields such as Nuclear Medicine and Diagnostic Ultrasound. There is increasing demand for highly skilled labor in the healthcare field in our region. The Wisconsin Department of Workforce Development projects statewide growth in the Diagnostic Medical Sonographer occupation by 18.8 percent for the period 2022 to 2032. Similarly, it is anticipated that Wisconsin Radiologic Technologists

and Technicians will see a 9.1 percent growth in their occupation in the same period.[1] Standard undergraduate tuition and fee rates for the Rock County campus will apply,

Presenter

- Dr. Robin Fox, Interim Provost and Vice Chancellor for Academic Affairs

BACKGROUND

This proposal is presented in accord with UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting, available at https://www.wisconsin.edu/uw–policies/uw-system-administrative-policies/policy-on-university-of-wisconsin-system-array-management-program-planning-delivery-review-and-reporting-2/).

Information on recent academic program changes is available on the program monitoring dashboard at https://www.wisconsin.edu/opar-frontier/uws-academic-program-changes/.

Related Policies

- Regent Policy Document 4-12: Academic Program Planning, Review, and Approval in the University of Wisconsin System

- UW System Administrative Policy 102: Policy on University of Wisconsin System Array Management: Program Planning, Delivery, Review, and Reporting

ATTACHMENTS

A) Request for Authorization to Implement
B) Cost and Revenue Projections Worksheet
C) Cost and Revenue Projections Narrative
D) Provost's Letter

[1] Wisconsin Department of Workforce Development, Office of Economic Advisors, *Wisconsin Long Term Occupation Projections, 2022-2032*, July 2024, https://jobcenterofwisconsin.com/wisconomy/wits_info/downloads/projections/lt_occ.xlsx

REQUEST FOR AUTHORIZATION TO IMPLEMENT A BACHELOR OF SCIENCE IN MEDICAL SCIENCES AT UNIVERSITY OF WISCONSIN-WHITEWATER PREPARED BY UW-WHITEWATER

ABSTRACT

The University of Wisconsin-Whitewater proposes to establish a Bachelor of Science (B.S.) in Medical Sciences. The program will offer a new area of growth in UW-Whitewater's program array at the baccalaureate level. In partnership with local partner Mercyhealth, the B.S. in Medical Sciences aims to address the increasing need for skilled workers in healthcare. In response to those needs, two emphases are being proposed in the program, one in radiologic technology and the other in diagnostic sonography. The program is comprised of 125-126 credits. After completing a 60-credit Associate of Arts and Sciences degree, students will be required to complete an additional 65-66 credits. Graduates will be prepared for various careers, such as Radiologic Technologists, MRI Technologists, Diagnostic Medical Sonographers, and specialists in fields such as Nuclear Medicine and Diagnostic Ultrasound. There is increasing demand for highly skilled labor in the healthcare field in our region. The Wisconsin Department of Workforce Development projects statewide growth in the Diagnostic Medical Sonographer occupation by 18.8 percent for the period 2022 to 2032. Similarly, it is anticipated that Wisconsin Radiologic Technologists and Technicians will see a 9.1 percent growth in their occupation in the same period.[1] Standard undergraduate tuition and fee rates for the Rock County campus will apply,

PROGRAM IDENTIFICATION

University Name
University of Wisconsin-Whitewater

Title of Proposed Academic Program
Medical Sciences

Degree Designation
Bachelor of Science (B.S.)

Suggested Classification of Instructional Program (CIP) Code
51.1005 Clinical Laboratory Science/Medical Technology/Technologist

[1] Wisconsin Department of Workforce Development, Office of Economic Advisors, *Wisconsin Long Term Occupation Projections, 2022-2032*, July 2024, https://jobcenterofwisconsin.com/wisconomy/wits_info/downloads/projections/lt_occ.xlsx

Mode of Delivery
Single university; In-Person

Department or Functional Equivalent
Department of Integrated Studies

College, School, or Functional Equivalent
College of Integrated Studies

Proposed Date of Implementation
Fall 2025

PROGRAM INFORMATION

Overview of the Program

The B.S. in Medical Sciences program at the University of Wisconsin (UW)-Whitewater, developed in partnership with Mercyhealth, aims to address the increasing need for skilled healthcare workers, particularly in radiologic technology and diagnostic sonography. Students will complete 125-126 credits, including general education, pre-professional coursework, and clinical study. General education requirements are incorporated as part of the Associate of Arts and Sciences degree at the UW-Whitewater College of Integrated Studies, encompassing prerequisites for admission into the clinical program. After meeting the program admission requirements, students complete 65-66 credits of clinical study. These supervised clinical experiences are paramount, with students spending 40-plus hours per week in a clinical setting and gaining hands-on experience with a diverse patient population. Faculty and instructional staff in Mercyhealth's School of Radiography and Javon Bea Hospital School of Sonography will deliver the clinical requirements. Instructional costs will be covered through an existing memorandum of understanding between UW-Whitewater and Mercyhealth.

Projected Enrollments and Graduates by Year Five

Projected student enrollment in the clinical program is based on current enrollment trends for Mercyhealth's School of Radiography and Javon Bea Hospital School of Sonography, enrollment trends in the pre-nursing emphasis of the College of Integrated Studies, and comparable programs in Wisconsin. It is anticipated that 10 new students will be accepted into the clinical program in the first year, five in each emphasis, based on student demand expressed by Mercyhealth. Enrollment is expected to stabilize by year five, reaching the current clinical capacity of Mercyhealth. In Years 2 through 5, continuing students are those who enrolled as new students in the prior years and continue to progress toward their degree. The student retention rate is projected to be 85 percent, based on the retention rates witnessed by Mercyhealth's certificate programs. By the end

of year five, it is expected that 84 students will have enrolled in the program, and 52 will have graduated with a B.S. in Medical Sciences from UW-Whitewater.

In addition, the program is expected to draw additional enrollment into the UW-Whitewater Associate of Arts and Sciences program, in general, and the pre-nursing emphasis in particular.

Table 1: Five-Year Enrollment and Completion Projections by Headcount

Students/Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	10	14	18	20	22
Continuing Students	0	8	12	15	17
Total Enrollment	10	20	30	35	39
Graduating Students	0	8	12	15	17

Tuition Structure

For students enrolled in the B.S. in Medical Sciences program, standard undergraduate tuition and fee rates for the Rock County campus baccalaureate programs will apply. Tuition rates for the Academic Year 2024-2025 are $286.58 per credit for Wisconsin residents and $633.75 for non-resident students. Fees for full-time students include $18.23 per credit for segregated fees and $7.02 per credit for textbook rental. While all program courses will be delivered in-person, students may choose to enroll in prerequisite courses online, for which a distance education fee of $50.00 per credit applies.

Student Learning Outcomes and Program Objectives

Upon completing the B.S. in Medical Sciences, students will achieve the program-specific learning outcomes indicated below and specific to the curricular emphases in Tables 3 and 4. The B.S. in Medical Sciences will adopt the use of curricula that are in alignment with the accreditation requirements of Radiologic Technology through the Joint Review Commission on Radiologic Technology (JRCERT, Radiologic Technology emphasis) and the Commission on Accreditation of Allied Health Programs (CAAHEP, Diagnostic Sonography emphasis). These program learning outcomes guide the curriculum and ensure that students' knowledge and skills are current and align with workforce needs. The general student learning outcomes include:

1. Students will be able to demonstrate critical thinking and problem-solving skills.
2. Students will be clinically competent.
3. Students will effectively communicate with patients and health care workers.
4. Students will display professional judgment, ethics, values, and communication.

Graduates of the program will be prepared to take the certification exams relevant to their chosen fields. For the Diagnostic Sonography emphasis, licensure requirements are satisfied by students' completion of the program curriculum and successful completion of the registry exam offered by the American Registry for Diagnostic Medical Sonography

(ARDMS). Upon successfully completing the Radiologic Technology emphasis, graduates can apply for admission to the American Registry of Radiologic Technologists (ARRT) certification exam.

Program Requirements and Curriculum

Students will be eligible to apply for the B.S. in Medical Sciences upon completing the program admission prerequisites and degree requirements of the Associate of Arts and Science degree at the College of Integrated Studies (60 credits). To be admitted to the program, students are required to have an overall GPA of 2.5 on a 4-point scale for all pre-clinical coursework. In addition, a minimum grade of C must be earned in each prerequisite course. All prerequisite courses meet the requirements for the A.A.S. degree.

Table 2 illustrates the B.S. in Medical Science's general education and prerequisite requirements.

Table 2: Bachelor of Science in Medical Sciences Program Curriculum

Associate of Arts and Sciences Degree		**60 credits**
General Education Requirements (GER) and AAS Degree Requirements *(not including prerequisites to the major that also fulfill these requirements)*		22-26 credits
Major Prerequisites		
BIO 105	Medical Terminology	1 credit
BIO 121	Foundations of Biological Sciences I	5 credits
BIO 285	Anatomy and Physiology	4 credits
BIO 286	Anatomy and Physiology	4 credits
BIO 310	Pathophysiology	3 credits
CHE 125	Introductory Chemistry	5 credits
CTA 103	Introduction to Public Speaking	3 credits
PSY 202	Introductory Psychology	3 credits
PSY 250	Life Span Developmental Psychology	3 credits
and		
Unique Prerequisites Radiologic Technology Emphasis		
CPS 105	Computer Applications	3 credits
PHY 141	College Physics I	4 credits
or		
Unique Prerequisites Diagnostic Sonography Emphasis		
MAT 117	Elementary Statistics	3 credits

Each emphasis within the B.S. in Medical Sciences program includes curricula that align with the specialized accreditation requirements. Tables 3 and 4 illustrate the curriculum for each emphasis. Supervised clinical experiences are vital to students' success in the program. Clinical experiences will consist of immersive experiences in a clinical

setting across a diverse patient population. Students can expect to spend 40-plus hours per week learning in a clinical setting while in the program.

Table 3: B.S. in Medical Sciences Curriculum, Radiologic Technology Emphasis

General Education, AAS, and Major Prerequisites (see Table 2)		**60 credits**
Academic degree program or major course requirements:		**66 credits**
MED 300	Patient Care	2 credits
MED 301	Radiographic Anatomy I	4 credits
MED 302	Radiographic Physics I	2 credits
MED 303	Radiographic Positioning I	3 credits
MED 304	Clinical Radiography I	6 credits
MED 305	Image Analysis I	2 credits
MED 306	Venipuncture and Pharmacology	1 credit
MED 351	Radiographic Anatomy II	2 credits
MED 352	Radiographic Physics II	3 credits
MED 353	Radiographic Positioning II	3 credits
MED 354	Clinical Radiography II	6 credits
MED 355	Image Analysis II	2 credits
MED 356	Radiobiology/Radiation Protection	2 credits
MED 401	Radiographic Anatomy III	2 credits
MED 402	Radiographic Physics III	2 credits
MED 403	Radiographic Positioning III	2 credits
MED 404	Clinical Radiography III	6 credits
MED 405	Image Analysis III	2 credits
MED 406	Pathology	2 credits
MED 450	Related Imaging and Special Procedures	2 credits
MED 451	Registry Review	4 credits
MED 454	Clinical Radiography IV	6 credits
Total Credits		**126 credits**

Table 4: B.S. in Medical Sciences Curriculum, Diagnostic Sonography Emphasis

General Education, AAS, and Major Prerequisites (see Table 2)		**60 credits**
Academic degree program or major course requirements:		**65 credits**
MED 310	Foundations of Sonography	3 credits
MED 311	Sonography in Patient Care	3 credits
MED 312	Abdominal Sonography	2 credits
MED 318	Sonography Practicum I	4 credits
MED 360	Sonography Principles & Instrumentation	3 credits
MED 361	Obstetrics and Gynecology Sonography I	2 credits
MED 362	Abdominal Sonography II	2 credits
MED 368	Sonography Practicum II	3 credits
MED 369	Sonography Clinical Lab I	6 credits
MED 410	Vascular Sonography I	2 credits
MED 417	Sonography Principles & Instrumentation Registry Review	2 credits
MED 418	Sonography Practicum III	3 credits
MED 419	Sonography Clinical II	5 credits
MED 460	Vascular Sonography II	2 credits
MED 461	Obstetrics and Gynecology Sonography II	2 credits
MED 468	Sonography Practicum IV	2 credits
MED 469	Sonography Clinical III	6 credits
MED 486	Abdominal and Ob/Gyn Sonography Registry Review	2 credits
MED 487	Vascular Technology Registry Review	2 credits
MED 488	Sonography Practicum V	3 credits
MED 489	Sonography Clinical IV	6 credits
Total Credits		**125 credits**

Collaborative Nature of the Program

During the first two years of study, students will complete general education requirements and the required scientific prerequisites in the College of Integrated Studies. They will earn the Associate of Arts and Sciences degree. If students meet the academic requirements, they will be admitted to the professional phase of the program during the spring semester of their second year. The clinical program would then begin the following semester. Professional curriculum and clinical experiences will be offered through a partnership with Mercyhealth, a regional health care system. Students will complete on-site courses that align with the Radiologic Technology certificate or Diagnostic Medical Sonography certificate. The following locations will be utilized: Javon Bea Hospital-Riverside, Mercyhealth Hospital and Trauma Center, Mercyhealth Hospital and Medical Center-Walworth, Mercyhealth McHenry, Mercyhealth Woodstock, Mercyhealth Women's Center-Rockford, and Mercyhealth Hospital and Physician Clinic-Crystal Lake.

Projected Time to Degree

It is anticipated that full-time students in the proposed program will be able to be completed within four years.

Accreditation

Authorization to offer the proposed program will fall under UW-Whitewater's institutional accreditation by the Higher Learning Commission. Additional HLC notices or approvals may be pursued after authorization and prior to implementation. The necessary professional accreditation is held through Mercyhealth partners for the two proposed Medical Sciences emphases. The Mercyhealth School of Radiology certificate is accredited by the Joint Review Commission on Radiologic Technology (JRCERT, 8-year accreditation was awarded in 2019).[2] Mercyhealth's Javon Bea Hospital School of Sonography certificate is accredited by The Commission on Accreditation of Allied Health Programs (CAAHEP, 5-year accreditation was awarded in 2020).[3]

PROGRAM JUSTIFICATION

Rationale

Health science fields have experienced significant growth in recent years, and projections anticipate continued growth. In 2023, 414,600 individuals were in the national workforce across the two proposed program areas.[4] Nationwide, healthcare work is projected to grow faster than the average of all other professions, equating to roughly 1.9 million openings annually for the next 10 years.[5] UW-Whitewater at Rock County is responding to the needs of the local community and is strategically positioning the campus as an option for individuals with some college education to convert their education into a UW degree, especially in these well-paid, high-demand healthcare careers. The development of a B.S. in Medical Sciences expands on the pre-nursing A.A.S. emphasis to strengthen the healthcare workforce of South Central Wisconsin.

Through a strong partnership with Mercyhealth, a Universities of Wisconsin Regents Business Partnership Award recipient, and with minimal additional resources, UW-

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[2] Mercyhealth, School of Radiology, 2025, https://www.mercyhealthsystem.org/education-programs/school-of-radiography/

[3] Mercyhealth, Accreditation, 2025, https://www.mercyhealthsystem.org/education-programs/school-of-sonography/accreditation/

[4] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Diagnostic Medical Sonographers and Cardiovascular Technologists and Technicians, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm#tab-1; U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Radiologic and MRI Technologists, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/radiologic-technologists.htm

[5] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Healthcare Occupations, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/

Whitewater can leverage its existing curriculum to provide general education and prerequisite coursework for the major. The students in the proposed Medical Sciences program will join a strong cohort of pre-nursing program students and will share the advantage of completing their degrees, even when place-bound.

Institution and Universities of Wisconsin Program Array

This program, while a new distinct area for a bachelor's degree at UW-Whitewater, builds upon currently offered curricula in the Associate of Arts and Sciences degree and currently offered certificates at Mercyhealth.

Four UW universities offer bachelor's degree programs in the CIP area 51.1005, Clinical Laboratory Science/Medical Technology/Technologist. UW-La Crosse offers a B.S. in Clinical Laboratory Science, UW-Milwaukee offers a B.S. in Biomedical Sciences, and UW-Oshkosh and UW-Stevens Point each offer a B.S. in Medical Laboratory Science. The UW-Milwaukee program includes concentrations in diagnostic imaging and sonography. Two UW universities offer bachelor's degree programs in the CIP area of 51.0907: Medical Radiologic Technology/Science. UW-La Crosse offers a B.S. in Radiologic Science, and UW-Oshkosh offers a B.S. in Medical Imaging.

The Janesville-Beloit and Green County community is the largest in Wisconsin without a four-year UW university. This program provides place-bound students with access to bachelor's degrees.

Need as Suggested by Student Demand

The creation of the proposed B.S. in Medical Sciences respects, responds to, and anticipates the needs of South Central Wisconsin and the community by providing students with a cost-effective and flexible route to acquire skills and develop into effective technologists in the medical field. A large local healthcare system, Mercyhealth, currently offers radiologic technology and diagnostic sonography certifications. Mercyhealth approached UW-Whitewater as a local university partner to leverage that training into a bachelor-level degree program for those specialties via a local program that will attract and retain employees. Program directors at Mercyhealth indicate that student interest exceeds capacity. Based on this student interest, this degree was developed to allow students to complete the Associate of Arts and Sciences from the College of Integrated Studies and then receive their B.S. in Medical Sciences with an emphasis in either radiologic technology or medical diagnostic sonography. Partnering with Mercyhealth will allow students to receive bachelor's degree training in the technical areas.

Need as Suggested by Market Demand

There is increasing demand for highly skilled labor in the healthcare field in South Central Wisconsin. The Wisconsin Department of Workforce Development predicts statewide growth in the Diagnostic Medical Sonographer occupation by 18.8 percent between 2022 and 2032. Similarly, Wisconsin Radiologic Technologists and Technicians are

projected to see a 9.1 percent growth in their occupation in the same period.[6] Despite this, conversations with our partners in the region have indicated that there are few accessible bachelor-level programs in radiologic and diagnostic sonography in the South Central Wisconsin region. This new degree pathway allows students to complete health prerequisites and general education from the College of Integrated Studies and then receive their bachelor's degree in Medical Sciences with an emphasis in either Diagnostic Sonography or Radiologic Technology. By earning a B.S., graduates will have accelerated opportunities for advancement and salary increases.

Graduates in Radiologic Technology typically go on to careers in Nuclear Medicine, Mammography, Diagnostic Ultrasound, Interventional Procedures, Computerized Tomography, Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), General Diagnostic, and Fluoroscopic Radiography. Radiologic and MRI technologists work in healthcare facilities, with more than half working in hospitals.[7] In 2023, the median salary was $73,410 for a radiologic technologist, and $83,740 for MRI technologists.[8]

In 2023, 271,200 Radiologic and MRI Technologists were in the workforce nationwide.[9] Per the Bureau of Labor Statistics, the national employment outlook for this profession is projected to grow by six percent through 2033, which is faster than the average of all other professions and equates to 16,000 openings each year, on average, over the course of 10 years (2023-2033).[10]

Graduates in the Diagnostic Sonography emphasis operate specialized equipment that uses high-frequency sound waves to produce dynamic visual images of organs, tissues, or blood flow inside the body. Most diagnostic medical sonographers work in

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[6] Wisconsin Department of Workforce Development, Office of Economic Advisors, *Wisconsin Long Term Occupation Projections, 2022-2032*, July 2024, https://jobcenterofwisconsin.com/wisconomy/wits_info/downloads/projections/lt_occ.xlsx

[7] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Radiologic and MRI Technologists, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/radiologic-technologists.htm#tab-3

[8] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Radiologic and MRI Technologists, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/radiologic-technologists.htm#tab-5

[9] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Radiologic and MRI Technologists, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/radiologic-technologists.htm#tab-1

[10] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Radiologic and MRI Technologists, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/radiologic-technologists.htm#tab-6

healthcare settings such as hospitals.[11] In 2023, the median salary for diagnostic medical sonographers was $84,470.[12]

In 2023, there were 143,300 Diagnostic Medical Sonographers in the national workforce.[13] According to the Bureau of Labor Statistics, the national employment outlook for this profession is projected to grow 11 percent through 2033, which is much faster than the average of all other professions and equates to 9,400 openings each year, on average, over the course of 10 years (2023-2033).[14]

[11] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Diagnostic Medical Sonographers and Cardiovascular Technologists and Technicians, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm#tab-3
[12] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Diagnostic Medical Sonographers and Cardiovascular Technologists and Technicians, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm#tab-5
[13] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Diagnostic Medical Sonographers and Cardiovascular Technologists and Technicians, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm#tab-1
[14] U.S. Bureau of Labor Statistics, Occupational Outlook Handbook – Diagnostic Medical Sonographers and Cardiovascular Technologists and Technicians, last modified August 29, 2024, https://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm#tab-6

University of Wisconsin - Whitewater Cost and Revenue Projections For B.S. in Medical Sciences						
	Items	**Projections**				
		2025	**2026**	**2027**	**2028**	**2029**
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
I	**Enrollment (New Student) Headcount**	10	14	18	20	22
	Enrollment (Continuing Student) Headcount	0	8	12	15	17
	Enrollment (New Student) FTE	10	14	18	20	22
	Enrollment (Continuing Student) FTE	0	8	12	15	17
II	**Total New Credit Hours**	330	462	594	660	726
	Existing Credit Hours	0	264	396	495	561
III	**FTE of New Faculty/Instructional Staff**	0	0	0	0	0
	FTE of Current Fac/IAS	0	0	0	0	0
	FTE of New Admin Staff	0.25	0.25	0.25	0.25	0.25
	FTE Current Admin Staff	0	0	0	0	0
IV	**Revenues**					
	Tuition	$68,779	$151,314	$206,338	$240,727	$268,239
	Fees (indicate type)	$0	$0	$0	$0	$0
	Program Revenue (Grants)	$0	$0	$0	$0	$0
	Program Revenue - Other	$0	$0	$0	$0	$0
	GPR (re)allocation	$0	$0	$0	$0	$0
	Total Revenue	**$68,779**	**$151,314**	**$206,338**	**$240,727**	**$268,239**
V	**Expenses**					
	Salaries plus Fringes					
	Faculty Salary	$17,250	$17,250	$17,250	$17,250	$17,250
	Instuctional Academic Staff	$0	$0	$0	$0	$0
	Administrative and Student Support Staff	$3,000	$3,000	$3,000	$3,000	$3,000
	Other Staff	$0	$0	$0	$0	$0
	Fringe Faculty and Academic Staff	$7,574	$7,574	$7,574	$7,574	$7,574
	Fringe University Staff	$0	$0	$0	$0	$0
	Fringe Other Staff	$0	$0	$0	$0	$0
	Facilities and Capital Equipment					
	University buildings and space	$0	$0	$0	$0	$0
	Capital Equipment	$0	$0	$0	$0	$0
	Operations	$0	$0	$0	$0	$0
	Other Expenses					
	Revenue share to Mercyhealth	$50,000	$110,000	$150,000	$175,000	$195,000
	Marketing	$5,000	$5,000	$5,000	$5,000	$5,000
	Total Expenses	**$82,824**	**$142,824**	**$182,824**	**$207,824**	**$227,824**
	Net Revenue	**-$14,044**	**$8,491**	**$23,514**	**$32,904**	**$40,415**

Provost's Signature: **Date:**

John D. Chenoweth

2/12/2025

Chief Business Officer's Signature: **Date:**

Brenda L. Jones

2/13/2025

COST AND REVENUE PROJECTIONS NARRATIVE
UNIVERSITY OF WISCONSIN-WHITEWATER
BACHELOR OF SCIENCE IN MEDICAL SCIENCES

PROGRAM INTRODUCTION

The University of Wisconsin (UW)-Whitewater proposes to establish a Bachelor of Science (B.S.) in Medical Sciences with emphases in Diagnostic Medical Sonography and Radiologic Technology. In partnership with Mercyhealth, this program will address the increasing need for skilled workers seeking to earn a baccalaureate in healthcare, particularly in radiologic technology and diagnostic medical sonography. The students are admitted into the clinical program after successfully completing the College of Integrated Studies' Associate of Arts and Sciences (A.A.S.). The next four semesters of study will be completed on-site with Mercyhealth. Students will pay standard undergraduate tuition at the baccalaureate rate for the Rock County campus, and instructional costs are covered through revenue share to Mercyhealth.

COST REVENUE NARRATIVE

Section I – Enrollment

Student headcount reflects the anticipated new student enrollment admitted into the clinical program based on current enrollment trends at Mercyhealth's School of Radiography and Javon Bea Hospital School of Sonography, the pre-nursing emphasis of the College of Integrated Studies, and comparable programs in the state. It is anticipated that 10 new students will be accepted into the clinical program in the first year. Enrollment is expected to stabilize by year five, reaching the current clinical capacity of Mercyhealth. In Years 2 through 5, continuing students represent those who enrolled as new students in the prior years but haven't completed the degree. Retention is anticipated to be approximately 85 percent, based on the retention rates in similar healthcare-related programs. By the end of Year 5, it is expected that 84 students will enroll in the program, and 52 will have graduated.

Section II – Credit Hours

The B.S. in Medical Sciences program comprises 125-126 credits, including 65-66 credits of major requirements. Credit hour projections are based on credits attributable to the major. Prior to admission to the clinical program, students must complete the Associate of Arts and Sciences degree. Major credits extend over two years after students are admitted into the clinical program; 33 credits per year are used to calculate the total credits for both the program's first year and for continuing students.

Section III – Faculty and Staff Appointments

The proposed B.S. in Medical Science will utilize established faculty and instructional staff in Mercyhealth's School of Radiography and Javon Bea Hospital School of Sonography. Instructional costs will be covered through an existing memorandum of understanding between UW-Whitewater and Mercyhealth. To promote the proposed program, collaborate with partners, provide students with individualized advising, and coordinate course offerings, a 3-credit teaching reassignment each semester is included.

Section IV – Program Revenues

Tuition

Tuition estimates for the proposed program use the bachelor-level resident tuition in the College of Integrated Studies at the Rock County campus. Based on tuition rates for the 2024-2025 academic year, this rate is $286.58 per credit. To adjust for the 12-18 credit tuition plateau, only 12 credits are attributed to each student per semester.

Fees

Fees for full-time students include $18.23 per credit for segregated fees and $7.02 per credit for textbook rental. While all program courses will be delivered in-person, students may enroll in prerequisite courses online, for which a distance education fee of $50.00 per credit applies. These fees are not included as revenue in the cost and revenue projections because these revenues are directed to other university units.

Program Revenues and GPR

No other anticipated program revenue streams or GPR are expected for this program.

Section V – Program Expenses

Salary and Fringe

The faculty coordinator will receive a one-course reassignment per semester (0.25 FTE) and a summer stipend of $3,000 to meet all academic admissions and advisement obligations. Salary expenses are calculated using average salaries for staff already in place. Fringe is included based on a 37.4 percent rate for faculty and academic staff.

Facilities and Capital Equipment

Partner facilities will be utilized for this program. The program does not require any specific new construction or facility investments; therefore, no expenses are attributed to the program.

Other Expenses

Per the memorandum of understanding between UW-Whitewater and Mercyhealth, UW-Whitewater will share a portion of the revenue to cover instructional and program expenses that Mercyhealth will contribute for the clinical program at the equivalent rate of Mercyhealth's tuition and fees for their certificate programs. Current Mercyhealth tuition and fees for the Radiologic Technology program are $3,750 per year. For Diagnostic Medical Sonography, annual tuition and fees total $6,250.

Program marketing will be an additional expense. UW-Whitewater intends to commit marketing funds of $5,000 per year. The Department of Integrated Studies receives sufficient library resources from the College of Integrated Studies to support the program.

Section VI – Net Revenue

Positive net revenue is projected from Year 2 and thereafter. Net revenues will be invested in support of program and faculty development, and the general support of the College of Integrated Studies and the University of Wisconsin-Whitewater. The support includes course delivery, instructional design, program marketing, and other items captured in the budget. Additionally, net revenues may be used to invest in other new programs, offer scholarships, and market the program further.

UNIVERSITY OF WISCONSIN
WHITEWATER

Office of the Provost

February 14, 2025

Jay Rothman
President, UW System
1720 Van Hise Hall
1220 Linden Drive
Madison, WI 53706

Dear President Rothman,

Please accept UW-Whitewater's Letter of Commitment for University of Wisconsin-Whitewater's proposed Bachelor of Science (B.S.) in Medical Sciences. This program expands on the existing pre-health emphasis in the Associate of Arts and Sciences from the College of Integrated Studies and was developed in partnership with local partner Mercyhealth, a Universities of Wisconsin Regents Business Partnership Award recipient. Aligned with the university's strategic goals, this program aims to address the increasing need for skilled workers in healthcare, particularly in radiologic technology and diagnostic sonography.

With this letter, I assert and make a firm commitment to the following:

1. The B.S. in Medical Sciences has been designed to meet the UW-Whitewater's definition and standards of quality and will contribute to our mission, overall academic plan, and academic degree program array. The program was developed in response to student and market demand.
2. There is university-wide support for the program, through every phase of our university governance processes. The proposal was approved by the Department and College of Integrated Studies, the Dean of the College of Integrated Studies, the University Curriculum Committee, and the UW-Whitewater Faculty Senate. All required approvals have been obtained on campus with enthusiastic support.
3. The necessary financial, capital, and human resources are in place and/or have been committed to implement and sustain the baccalaureate program. Department and college staff have thoroughly considered and planned for required resources needed to launch and maintain the program. A financial plan is in place to support and sustain the program.

The proposal for the new B.S. in Medical Sciences was developed using a very thorough and careful process. We have the necessary resources in place or firmly planned, and I am confident this program will be a success. The program will be a positive addition for UW-Whitewater, an attractive offering for students, and a benefit for workforce development in Wisconsin and the surrounding region. I am proud to recommend this new program for your approval and

approval by the members of the Board of Regents. I believe this is a strong and needed addition to the University of Wisconsin System program array.

Sincerely,

John Chenoweth
Provost and Vice Chancellor for Academic Affairs

cc: Johannes Britz, Vice President of Academic Affairs and Student Affairs
Tracy Davidson, Associate Vice President of Academic Affairs
Corey King, Chancellor
Kristin Plessel, Associate Vice Chancellor for Academic Affairs
Tricia Clasen, Dean, College of Integrated Studies

Education Committee **Item D.**
April 16, 2025

ACADEMIC UNIT REALIGNMENT UPDATE: UW-OSHKOSH

REQUESTED ACTION

For information and discussion.

SUMMARY

Over the past 18 months, the University of Wisconsin–Oshkosh (UWO) has engaged in a major restructuring of its academic enterprise to achieve financial savings, a more balanced distribution of students and staff, the alignment of UWO programs with widely recognized career clusters, and the potential for greater interdisciplinary connections and guided pathways to support student success. As UWO moves toward the final stages of building out new structures, the Provost and Faculty Senate president offer a summary of work to date and share lessons learned that might be of interest to institutions contemplating similar changes.

Presenters

- Edwin Martini, Provost and Vice Chancellor for Academic Affairs, UW-Oshkosh
- Pascale Manning, Faculty Senate President and Associate Professor, Department of English, UW-Oshkosh

BACKGROUND

In August 2023, UWO announced the intent to restructure its academic enterprise as part of a larger institutional realignment plan (IRP). The reasons for the academic realignment included financial benefits, with immediate savings from the consolidation of administrative work, a more balanced distribution of students and staff, the alignment of UWO programs with Wisconsin Department of Public Instruction (DPI) career clusters, and the potential for greater interdisciplinary connections and guided pathways to support student and faculty success. The realignment provides the transformative structural change for a sustainable University of Wisconsin–Oshkosh moving forward.

Over the course of the fall 2023 and spring 2024 semesters, as UWO weathered a series of challenges including the elimination of nearly 250 positions, the university community came together in a series of design workshops and forums and in the formation of an Academic Planning Workgroup composed of 36 faculty, staff, and administrators, to design prototypes of new academic structures that could achieve multiple goals. In February 2024, the group shared two potential models with the university, and in April the Faculty Senate held a referendum that resulted in the approval of a new structure.

That model, which was later approved by the Universities of Wisconsin System Board of Regents Education Committee and the full Board on August 22, 2024, shifts the structure of the UWO academy from its four existing colleges into three new colleges and its nearly 60 departments and interdisciplinary programs into six new schools.

Since the Board's approval, significant work has continued to build out the new structures. Much of that work has taken place behind the scenes, in mundane but critical technical tasks, such as the updating of reporting lines, budgets, and organizational charts (in a manner consistent with the needs of the systemwide Administrative Transformation Project) and the complete rebuilding of UWO's student information system to reflect the new homes of courses and curricula. Most recently, Faculty Senate leaders and their colleagues from across the university have been updating and crafting new policies, practices, and by-laws that will guide the new schools and colleges. The implementation of the new structure has been iterative and collaborative. Whereas the new structure does away with "departments," recognizing the six new schools as their functional equivalent, the implementation process has revealed the necessity of formally recognizing the units made up of subject area experts that will continue to oversee curricular and personnel processes. To this end, UWO has added "disciplines" to the overall structure and has done this without reinstating "departments." The final versions of faculty handbook changes requiring Board of Regents approval are scheduled to be completed later this semester and brought to the board for its July meeting. The official "go-live" date for the new structure remains aligned to the start of the new fiscal year: July 1, 2025.

The presentation today focuses less on the "what" of the work and more on the "why" and, especially, on the "how." The Provost and Faculty Senate president understood early on that this initiative could only be a success for the university if the UWO community worked together in support of a shared vision and in a spirit of collaboration, collegiality, and transparency. From the formation of the working groups to the faculty referendum to the ongoing work on crafting policies, collaboration and mutual respect between administration and shared governance has been essential to this project.

Previous Action

August 22, 2024 Resolution 12229	That, upon the recommendation of the Chancellor of UW Oshkosh and the President of the University of Wisconsin

System, the Board of Regents authorizes the University of Wisconsin Oshkosh to establish the College of Business, Arts, and Communication, the College of Public Affairs and Education, the College of Nursing, Health Professions, and STEM, and the School of Business, the School of Media, Arts, and Communication, the School of Public Affairs and Global Engagement, the School of Education and Human Services, the School of Nursing and Health Professions, and the School of Science, Technology, Engineering, and Mathematics.

ATTACHMENT

A) Updated Timeline of UWO Academic Restructuring Process

Updated Timeline of UW–Oshkosh Academic Restructuring Process

Fall 2023

- Announcement of process
- Design workshops
- Formation of working group and subgroups

Spring 2024

- Share realignment models with university
- Stand up academic restructure transition team (cross-institutional representation)
- Faculty Senate referendum vote

June/July 2024

- Implementation planning:
    - College and school names and assignment of deans and school directors
    - Framework for bylaws and governance
    - Area unit models and responsibilities; unit coordinator model and responsibilities
    - Campuswide workshops on curricular planning, policy, and bylaws

August 2024

- BOR approval of UWO plan
- Realignment units finalize structure for coding in new structure

Fall 2024

- Faculty and staff vote to approve school structures
- Identify and prepare any documentation for accrediting bodies
- Begin realigned student information system (SIS) conversions to production
- Faculty revising handbook, policies, bylaws

Spring 2025

- Faculty handbook review by Office of General Counsel
- Faculty Senate facilitation of faculty referendum
- Finalizing position descriptions for deans and school directors
- Faculty Senate vote on handbook revisions
- Finalizing administrative mapping of new structure

July 2025

- July 1, 2025: Operational go-live date
- Faculty handbook changes approved by Board of Regents

ADA TITLE II DIGITAL ACCESSIBILITY WORKGROUP UPDATE

REQUESTED ACTION

For information and discussion.

SUMMARY

The panel will provide a brief overview of digital accessibility, the new federal rule that applies to all websites and mobile applications in use across the Universities of Wisconsin, and the collective approach being taken to support compliance and implementation of best practices. Panelists will give examples of inaccessible and accessible content, tools used to identify and remediate inaccessible content, the limitations of these tools, and the role of faculty and staff in creating and maintaining digital content that is accessible to all participants in UW programs, services, and activities.

Presenters

- John Achter, Senior Director of Student Success and Wellbeing, Universities of Wisconsin Administration
- Amber Handy, Associate Vice Provost and Director of the Center for Excellence in Inclusive Teaching & Learning, UW-Parkside
- Ruben Mota, ADA Coordinator, UW-Madison
- Paige Smith, Chief Compliance and Risk Officer, Universities of Wisconsin Administration

BACKGROUND

In April 2024, the Department of Justice (DOJ) implemented a new rule—Nondiscrimination on the Basis of Disability; Accessibility of Web Information and Services of State and Local Government Entities ("rule")—for Title II of the Americans with Disabilities Act. This rule requires public universities' digital tools to be accessible. By April 24, 2026, all Universities of Wisconsin must ensure digital tools, including web and mobile applications, electronic documents, multimedia, and social media, used in their programs, services, and activities, are accessible. The DOJ's standard for compliance is the Web Content Accessibility Guidelines at level 2.1 AA [w3.org].

A systemwide workgroup was established to coordinate ADA Title II compliance activities across the Universities of Wisconsin, including interpretation of the new rule and identifying priorities, timelines, and resources to support the work. Attachment A provides additional resources and information related to digital accessibility requirements and methods for compliance.

Related Policies

- Regent Policy 14-10: Nondiscrimination on Basis of Disability
- System Administrative Policy 6XX: Accessibility of Web Content and Mobile Applications (draft under review)

RESOURCES

- Federal Register: Nondiscrimination on the Basis of Disability; Accessibility of Web Information and Services of State and Local Government Entities (full text of new rule)
- Fact Sheet: New Rule on the Accessibility of Web Content and Mobile Apps Provided by State and Local Governments (ADA.gov) (new rule summary)
- New ADA Title II Rule on Web Accessibility: Fact Sheet Guide | Accessible.org (updated March 10, 2025)
- State and Local Governments: First Steps Toward Complying with the ADA's Title II Web and Mobile Application Accessibility Rule (ADA.gov) (DOJ's implementation guidance)
- New Universities of Wisconsin Digital Accessibility Webpage

ATTACHMENTS

A) Video Introductions to Digital Accessibility Requirements and Remediation Examples Impacting Instructional Staff

Video Introductions to Digital Accessibility Requirements and Remediation Examples Impacting Instructional Staff

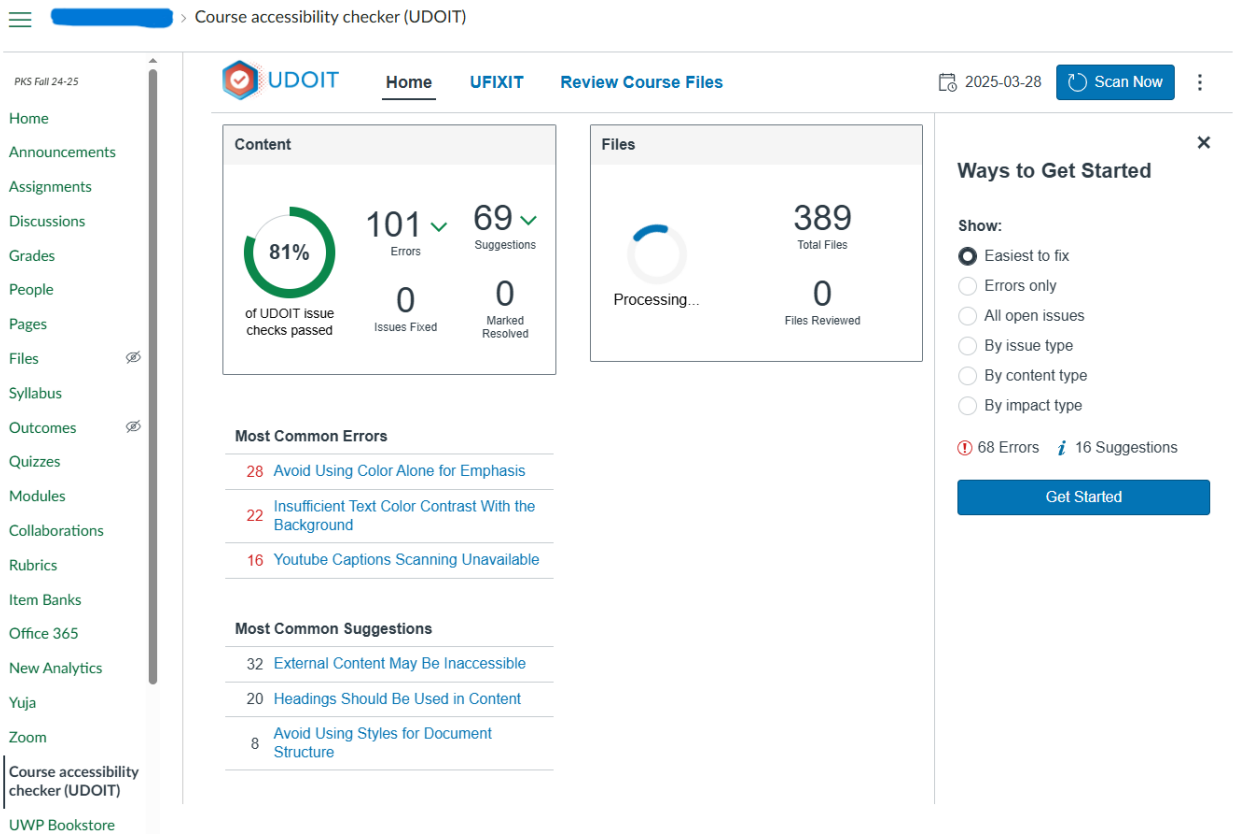
Video introductions to key digital accessibility requirements

- Introduction to Web Accessibility and World Wide Web Consortium (W3C) Standards (4 minutes; captions and text transcript with description of visuals available)
- Alternative Text (5 minutes; open captioned video)
- Color Contrast (3:40 minutes; open captioned video)
- Screen Reader Demonstrations
    - Text Formatting with Headings (0:15 minutes; captions available)
    - Hyperlinks: A "Click Here" Demo (0:34 minutes, captions available)
    - Screen Reader Reads Lists (0:49 minutes, captions available)
- Video Captions
    - Why Auto-Captions are Not Enough (5 minutes, open captioned video)

Remediation Examples in Canvas

This section explains some of the challenges faced by instructional staff working to make their Canvas course contents accessible in compliance with the new rule.

1. UDOIT Canvas course accessibility checker home page

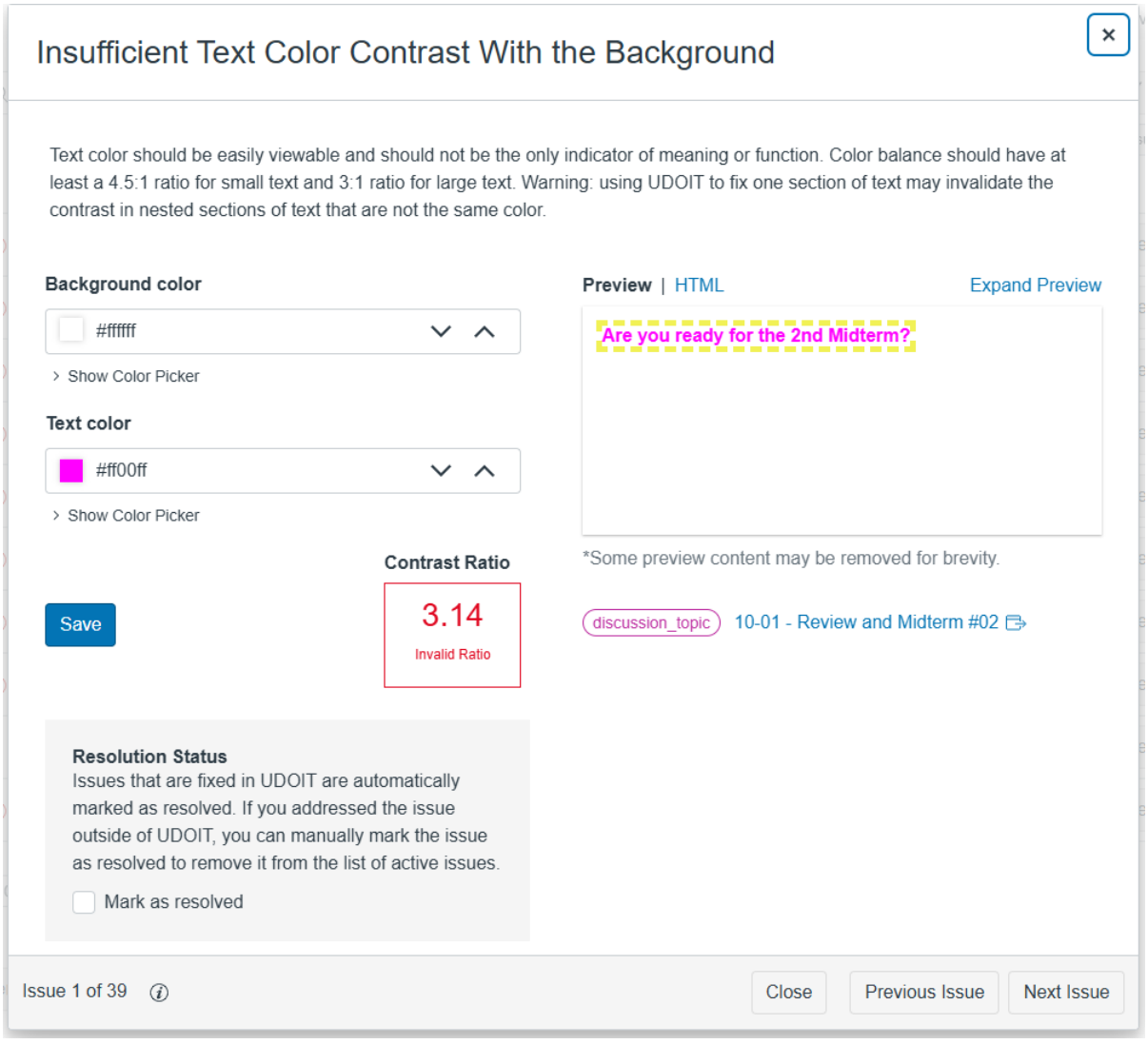


UDOIT is an accessibility detection tool available within Canvas at all 13 institutions. It is able to detect 44 accessibility issues and guide the course instructor through locating and remediating them. UDOIT distinguishes between errors, which the tool can confidently determine need to be resolved for accessibility, and suggestions, which are items that may need remediation, but human attention is required to be certain. UDOIT provides users with suggestions about how to remediate the errors. However, with our current license all remediation must be done manually, and each issue must be addressed individually.

2. **UDOIT: Using the UFIXIT tool to address individual errors**

While in the UDOIT tool in Canvas, faculty can select individual or groups of errors and suggestions to fix based on categories including type of error, level of difficulty, or level of impact for users, and more. After choosing how to approach their accessibility remediation work, faculty are moved into UFIXIT, where each error and suggestion is individually presented to the faculty for manual remediation.

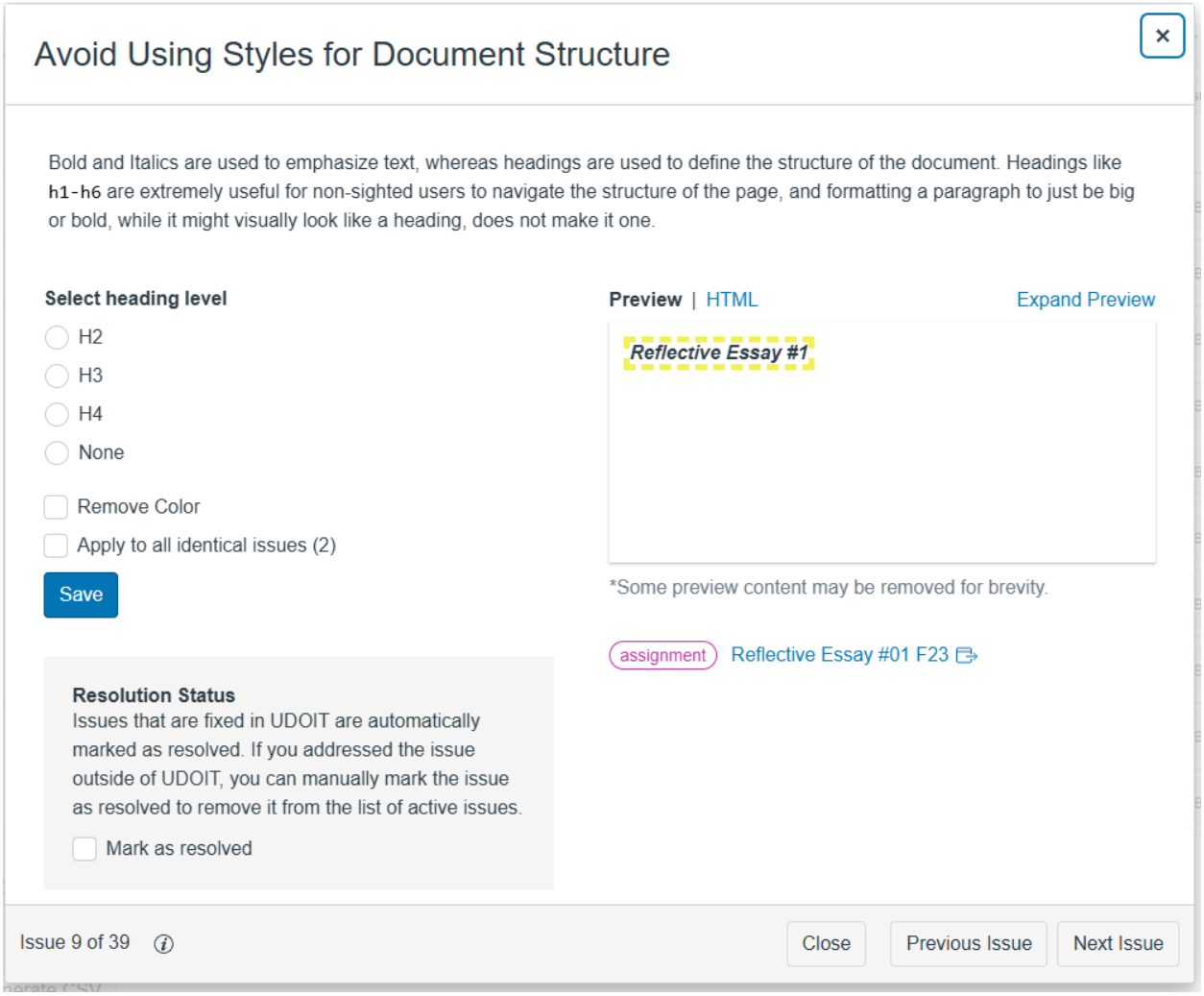
a. Insufficient Color Contrast



In the example above, the error is insufficient text color contrast with the background. The faculty member can select different text and background colors within the UFIXIT tool to reach the required minimum contrast ratio or can follow the link to the actual error inside their Canvas course and fix it there. They will then

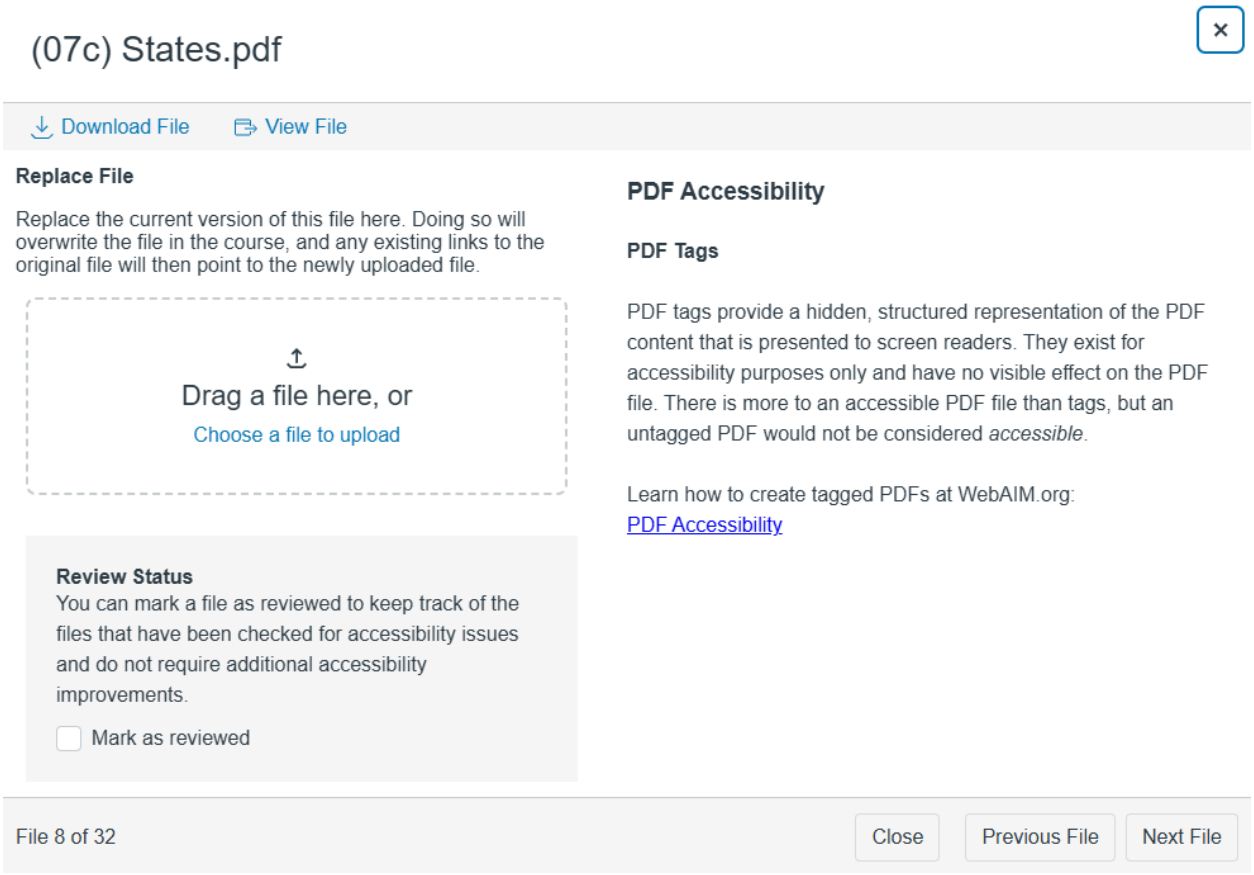
need to repeat the same action for each instance of color contrast error within the course.

b. UDOIT: Using the UFIXIT tool to address inappropriate use of styles



In this example, the UDOIT tool detected a stylistic error where the faculty member used bold and italics to emphasize text rather than using the built-in headings structure. Relying on styles like bold and italics are not sufficient for screen readers to recognize and alert their users to the importance of the highlighted text. Again, the faculty member can choose to fix the issue within the tool or click the link to visit and remediate the error directly within Canvas. Here there is an additional option to apply their selected fix to all identical issues in the course, but, given the variety of places and reasons the error may have occurred, it is recommended that faculty view and fix each error individually to be sure they are choosing the best resolution.

3. UDOIT: Identifying and remediating uploaded files within Canvas



The UDOIT tool can also scan for and present a list of every uploaded file within a Canvas course. Files can include documents, PDFs, slide decks, spreadsheets, etc. Unfortunately, UDOIT cannot scan those uploaded files to determine if they are accessible nor can it remediate files that are inaccessible. Instead, faculty will need to manually review each file by downloading it, making the file accessible in its own software, and then uploading the remediated file in UDOIT to replace the inaccessible file. UDOIT will then seek out and replace all copies of the inaccessible file within the Canvas course with the remediated file.

4. Accessible Files, PDF Example

Accessible PDFs, like most electronic documents, contain tags to provide hidden structural information to screen readers to help those tools navigate a document and correctly interpret the information to the screen reader user. These tags have no visible effect on the document itself, which means that they cannot be detected using a simple visual

inspection. Each document must be scanned individually with an accessibility checker to discover and manually remediate errors to ensure that it is accessible.

a. Example of an inaccessible PDF

How to Weave a Basket

Weaving a basket can be a fun and rewarding craft project. Here are some step-by-step directions to get you started:

Materials Needed:

- Basket weaving reed or natural materials like willow, rattan, or bamboo
- Scissors or pruning shears
- A large bowl or bucket of warm water (to soak the reeds)
- Clothespins or small clamps
- A flat work surface

Click here for recommended shopping sites

Steps:

1. *Soak the Reeds*:

   Begin by soaking your basket weaving reeds in warm water for about 30 minutes. This makes them flexible and easier to work with.

2. *Create the Base*:

   Cut an even number of reeds to the desired length for your basket's base.

   Lay half of the reeds vertically on your work surface, spaced evenly apart.

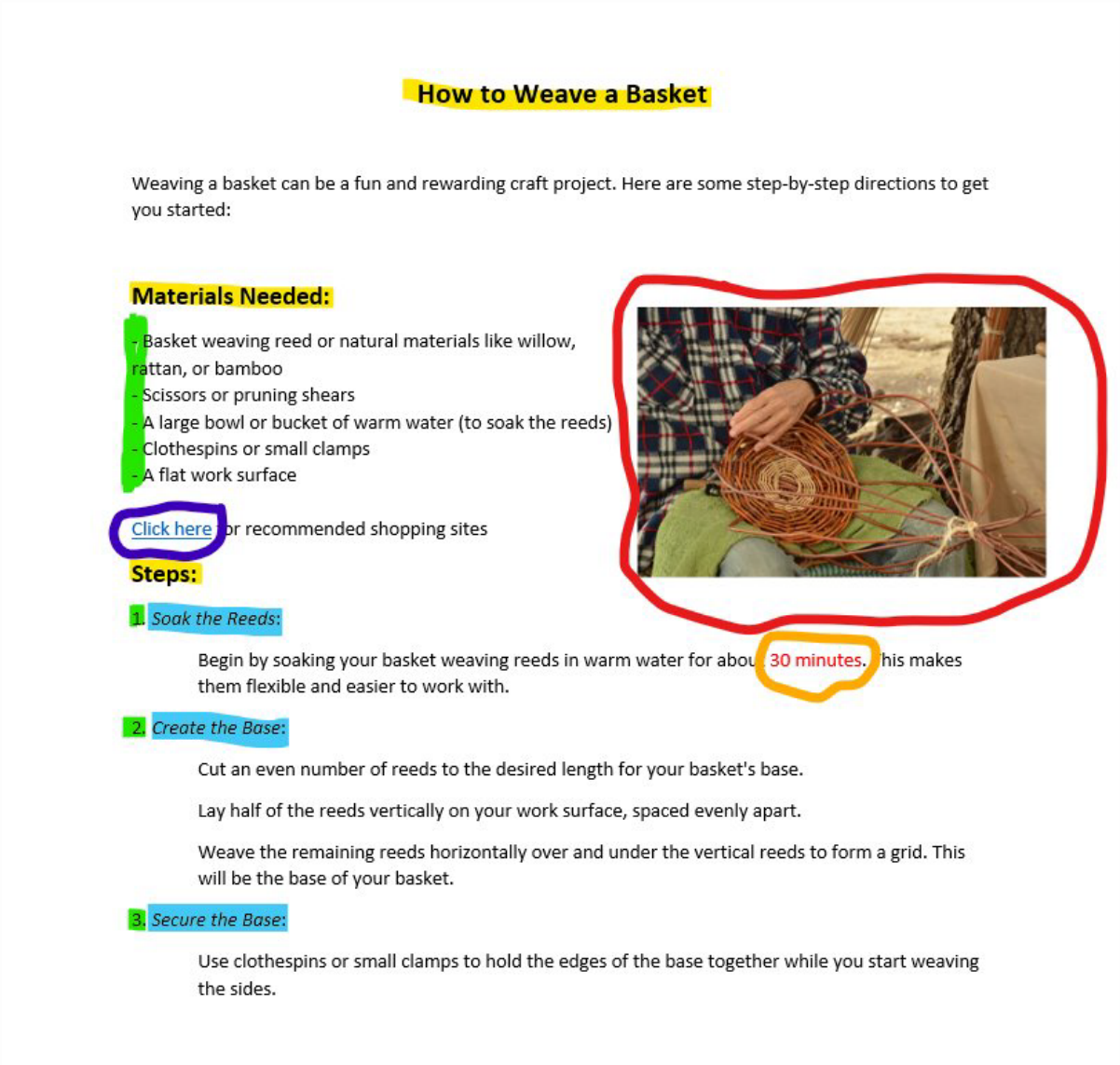
   Weave the remaining reeds horizontally over and under the vertical reeds to form a grid. This will be the base of your basket.

3. *Secure the Base*:

   Use clothespins or small clamps to hold the edges of the base together while you start weaving the sides.

The document above may appear to be accessible, but in fact it contains many accessibility errors as described below.

b. Highlighting errors in PDF



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   Lay half of the reeds vertically on your work surface, spaced evenly apart.

   Weave the remaining reeds horizontally over and under the vertical reeds to form a grid. This will be the base of your basket.

3. *Secure the Base:*

   Use clothespins or small clamps to hold the edges of the base together while you start weaving the sides.

This document contains the following errors:

i. Yellow: Improper use of headings. These were manually created rather than using the built-in heading tools in Word.
ii. Green: Improper use of numbering and bullet points. These were manually created rather than using the built-in list tools in Word.
iii. Light blue: Improper use of italics and headings.
iv. Dark blue: Non-descriptive link.
v. Orange: Not enough color contrast between text and background and use of color as sole means of emphasis.

vi. Red: Image lacks alt text description and is not in line with the main text, which can confuse screen readers about how to read the surrounding text.

c. Remediated PDF

How to Weave a Basket

Weaving a basket can be a fun and rewarding craft project. Here are some step-by-step directions to get you started:

Materials Needed:

- Basket weaving reed or natural materials like willow, rattan, or bamboo
- Scissors or pruning shears
- A large bowl or bucket of warm water (to soak the reeds)
- Clothespins or small clamps
- A flat work surface

Basket Makers Supply has all of these supplies at reasonable prices.

Steps:

1. Soak the Reeds:

   Begin by soaking your basket weaving reeds in warm water for about 30 minutes. This makes them flexible and easier to work with.

2. Create the Base:

   Cut an even number of reeds to the desired length for your basket's base.

   Lay half of the reeds vertically on your work surface, spaced evenly apart.

   Weave the remaining reeds horizontally over and under the vertical reeds to form a grid. This will be the base of your basket.

3. Secure the Base:

   Use clothespins or small clamps to hold the edges of the base together while you start weaving the sides.

After manually correcting the errors noted above, the accessible PDF might look like this. Note how difficult it is to determine visually whether this version or the initial version of the PDF is the accessible document.

5. **Accessible Video Content**

   To meet accessibility standards, course video content must have accurate captions and audio descriptions. Captions capture video audio in a visual way for those with auditory disabilities, while descriptions are audio voiceovers that describe visual elements of the video content to users with visual disabilities.

   a. Captioning challenges

      Machine-generated caption technology is improving, but it does not yet reliably deliver caption accuracy at the levels required for the Web Content Accessibility Guidelines (WCAG) 2.1AA standards we must meet. Faculty may encounter challenges if they speak with an accent that is not easily interpreted by the captioning tool. As an example, please view this Faculty Introduction Video for a business course (1:28 minutes, open captioned video). Introductory videos of this type are very common and encouraged as a best practice, especially but not exclusively in online courses. Faculty often include a general introduction for the course as well as separate lecture videos and introductions for each module. When you watch the video, compare the machine-generated captions to what you hear as the international faculty member follows all best practices for speaking speed and volume.

      Another frequent faculty challenge with machine-generated captions involves the use of disciplinary jargon. As an example, please view a portion of this Supplementary Support Video (8:34 minutes, open captioned video) from a chemistry course, focusing particularly on the second minute as a good example of the whole video. This is a supplementary, not required, video from a long and popular series created by the instructor to address student requests for additional support on challenging key concepts. The instructor's use of technical jargon causes errors in the machine-generated captions despite his American midwestern accent, which is usually captioned with better accuracy by these software programs.

      It can take a reasonably experienced user up to 10 minutes to remediate captions for one minute of video content.

b. Description challenges
   Video description software is currently not available to our faculty for individual use and must be contracted out to a third-party vendor. While some issues can be resolved by training faculty to describe images they are sharing on slides during a lecture, other imagery proves more challenging. For example, in the Supplementary Support Video above, the instructor uses a light board to draw molecular compounds and illustrate how they interact, which poses a significant challenge to video description.