BOARD OF REGENTS
AGENDA ITEM SUMMARY

Academic Affairs **April 11, 2025**

AGENDA ITEM: Proposal to establish an Undergraduate Certificate in Irrigation and Agricultural Water Management to be administered by the Department of Biological Systems Engineering in the College of Agricultural Sciences and Natural Resources at the University of Nebraska-Lincoln (UNL)

☐ **Review** ☒ **Review + Action** ☐ **Action** ☐ **Discussion**

☐ *This is a report required by Regents' Policy.*

PRESENTERS: David S. Jackson, Interim Provost

PURPOSE & KEY POINTS

The purpose of the proposed 18 credit hour Irrigation and Agricultural Water Management (IAWM) Certificate is to prepare students to be wise managers of irrigation, water resources, and agricultural systems. The primary audience is online, non-degree-seeking students. The online, asynchronous program will be of interest to early- to mid-career professionals in local (e.g., agricultural industry, Natural Resources Districts), national (e.g., KS, CO, CA), and international (Sub-Saharan Africa, MENA, Latin America) markets. This program is designed to meet workforce needs and does not require any additional resources.

BACKGROUND INFORMATION

Section 2.9 of the Bylaws of the Board of Regents provides that, "No curriculum leading to a degree or certificate shall be adopted…without the approval of the Board."

Nebraska Revised Statute §85-943 authorizes the University of Nebraska to offer certificates above the associate degree level in agriculturally related fields without restrictions related to course levels (1xx, 2xx, 3xx, etc.).

RECOMMENDATION

The President recommends approval.

December 2, 2024

Dr. David Jackson, Executive Vice President and Provost
University of Nebraska
3835 Holdrege Street
Lincoln, NE 68583-0745

Dear EVPP Jackson,

Attached please find a proposal to create a new Undergraduate Certificate in Irrigation and Agricultural Water Management to be administered by the Department of Biological Systems Engineering in the College of Agricultural Sciences and Natural Resources. The proposal was submitted to the EVC Office in the spring, and revisions and supporting documents were finalized this summer.

The enclosed proposal outlines the program of study, the gap that would be met with this program, and the workforce needs. The Undergraduate Certificate in Irrigation and Agricultural Water Management is designed as a fully online program but would also be delivered through traditional, in-person courses for degree-seeking students. The primary target audience is non-degree-seeking online students, and the program is expected to be attractive to early—and mid-career professionals. The proposed program does not require additional resources.

This proposed program has the full endorsement of the Academic Planning Committee, the Executive Vice Chancellor for Academic Affairs, Dean Tiffany Heng-Moss and VC Mike Boehm and the CASNR faculty and curriculum committees, and it has my approval. I am requesting you approve it and that it be reported to the Board of Regents at an upcoming meeting.

Sincerely,

Rodney D. Bennett
Chancellor

c: Jennifer Clarke, Chair, Academic Planning Committee
Katherine Ankerson, Executive Vice Chancellor
Michael Boehm, NU Vice President and IANR Harlan Vice Chancellor

University of Nebraska Lincoln
Office of the Chancellor
201 Canfield Administration, PO Box 880419 | Lincoln, NE 68588-0419 | 402.472.2116

Tiffany Heng-Moss, Dean, CASNR
Renee Batman, Assistant Vice Chancellor
Suzi Tamerius, Project Coordinator
Karen Griffin, Coordinator of Faculty Governance
Angela Iwan, Executive Assistant to the EVPP

University of Nebraska Lincoln

FACULTY SENATE OFFICE
ACADEMIC PLANNING COMMITTEE

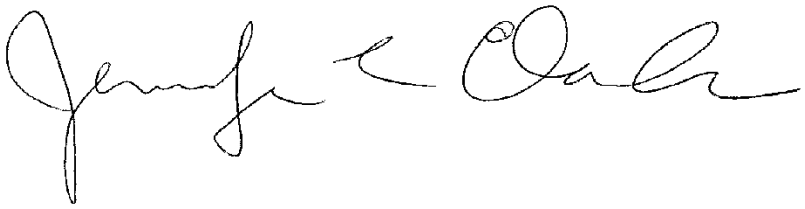
November 21, 2024

Chancellor Rodney Bennett
201 Canfield Administration
City Campus (0419)

Dear Chancellor Bennett:

The Academic Planning Committee (APC) considered a proposal to create an Undergraduate Certificate in Irrigation and Agricultural Water Management. The program is administered by the Department of Biological Systems Engineering in the College of Agricultural Sciences and Natural Resources. The APC voted to recommend approval of the proposal at its November 20, 2024, meeting and I am forwarding this proposal for your consideration.

Sincerely,



Jennifer Clarke, Chair, Academic Planning Committee and Professor, Food Science and Technology

c: Executive Vice Chancellor Katherine Ankerson
Vice Chancellor Michael Boehm
Dean Tiffany Heng-Moss
Professor Mark Stone
Associate to the Chancellor Josh Davis
Assistant Vice Chancellor Renee Batman
Project Coordinator Suzi Tamerius

135 Alexander Building /312 N. 14th Street/ Lincoln, NE 68588-0471/ (402) 472-2573 / EMAIL: kgriffin2@unl.edu

MEMORANDUM

TO: Academic Planning Committee Chair

FROM: Katherine Ankerson, Executive Vice Chancellor

DATE: September 6, 2024

SUBJECT: Proposal to Create an Undergraduate Certificate in Irrigation and Agricultural Water Management

Attached please find a proposal to create a new Undergraduate Certificate in Irrigation and Agricultural Water Management to be administered by the Department of Biological Systems Engineering in the College of Agricultural Sciences and Natural Resources. The proposal was submitted to the EVC Office in the spring, and revisions and supporting documents were finalized this summer.

The enclosed proposal outlines the program of study, the gap that would be met with this program, and the workforce need. The Undergraduate Certificate in Irrigation and Agricultural Water Management is designed as a fully online program, but would also be delivered through traditional, in-person courses for degree-seeking students. The primary target audience is non-degree seeking online students, and the program is expected to attractive to early- and mid-career professionals. The proposed program does not require additional resources.

This new certificate program has the full support of the CASNR faculty and curriculum committees, Dean Tiffany Heng-Moss and VC Mike Boehm. I fully support this proposal.

University of Nebraska Lincoln
Office of the Executive Vice Chancellor and Chief Academic Officer
208 Canfield Administration Building | P.O. Box 880420 | Lincoln, NE 68588-0420 | 402.472.3751 | FAX 402.472.4929

University of Nebraska Lincoln

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
OFFICE OF THE NU VICE PRESIDENT AND IANR HARLAN VICE CHANCELLOR

TO: Renee Batman
Assistant Vice Chancellor and Chief Administrative Officer

FROM: Michael Boehm
NU Vice President and IANR Harlan Vice Chancellor

SUBJECT: Proposal to Create a New Undergraduate Certificate in Irrigation and Agricultural Water Management (IAWM)

DATE: April 29, 2024

I am pleased to approve, in my role as chief academic officer for the College of Agricultural Sciences and Natural Resources (CASNR), the proposal to create a new Undergraduate Certificate in Irrigation and Agricultural Water Management (IAWM) as submitted by Tiffany Heng-Moss, Dean of CASNR. This new certificate was proposed by the faculty in the Department of Biological Systems Engineering and approved by the members of the CASNR Curriculum Committee on April 12, 2024. The CASNR faculty formally approved the certificate on April 29, 2024.

The Department of Biological Systems Engineering has a long and distinguished history of preparing talented, highly trained, and motivated professionals that contribute to the continued success of agriculture in Nebraska and beyond. The online, asynchronous program will be of interest to early- to mid-career professionals in local (e.g., agricultural industry, Natural Resources Districts), national (e.g., KS, CO, CA), and international (Sub-Saharan Africa, MENA, Latin America) markets. Prospective students include high school graduates who want a credential in IAWM, graduates from a community college who want more depth with a junior/senior-level credential in IAWM, and graduates from a university who want a credential specifically in IAWM.

Enclosed is a copy of the proposal and transmittal letters. If you need additional information, please do not hesitate to contact Dean Heng-Moss.

CC: Dean Tiffany Heng-Moss
Dr. Mark Stone

300 Agricultural Hall / P.O. Box 830708 / Lincoln, NE 68583-0708 / (402) 472-2871 / FAX (402) 472-5854

TO: Michael Boehm
NU Vice President and IANR Harlan Vice Chancellor

FROM: Tiffany Heng-Moss, Dean
College of Agricultural Sciences and Natural Resources

SUBJECT: Proposal to Create a New Undergraduate Certificate in Irrigation and Agricultural Water Management (IAWM)

DATE: April 29, 2024

I am pleased to support the proposal to create a new Undergraduate Certificate in Irrigation and Agricultural Water Management (IAWM). The certificate was developed by faculty in the Department of Biological Systems Engineering. The proposed certificate will be an 18-credit hour program focused on creating the opportunity for learners to gain knowledge across irrigation, water resources, and agricultural systems.

Due to UNL's unique position of being the only university in Nebraska to offer a strong and well-established undergraduate program in irrigation and agricultural water management, learners in Nebraska and beyond seeking additional certification would be able to leverage these courses to gain experience, knowledge, and advancement.

The certificate was approved by the members of the CASNR Curriculum Committee on April 12, 2024, and the CASNR faculty on April 29, 2024.

If you need additional information, please let me know.

Enclosure

University of Nebraska Lincoln
College of Agricultural Sciences and Natural Resources | Office of the Dean
103 Agricultural Hall | P.O. Box 830702 | Lincoln, NE 68583-0702 | 402.472.2201 | casnr.unl.edu

NCTA

TO: Tiffany Heng-Moss
Dean, College of Agricultural Sciences and Natural Resources

FROM: Larry Gossen
Dean, Nebraska College of Technical Agriculture

SUBJECT: Proposal to Create a New Undergraduate Certificate in Irrigation and Agricultural Water Management (IAWM)

DATE: April 26, 2024

Please consider this letter of support for the proposal to create a new Undergraduate Certificate in Irrigation and Agricultural Water Management (IAWM). As the Dean of NCTA, I am happy to support this plan as another way in which NCTA and CASNR work together to enhance the education opportunities of our students.

NCTA has a long history of working with CASNR in a collaborative relationship with A to B transfer programs, reverse articulation agreements, and various academic program cooperation. NCTA students benefit from the relationship and resources available with CASNR and the Institute of Agriculture and Natural Resources.

The Irrigation Technician certificate currently offered by NCTA will be a complement to the new IAWM certificate at CASNR. Having access to this certificate would be an opportunity for NCTA students to stack this credential to their associate degree. Stacked credentials are valued by business and industry and are a key part of the mission of NCTA.

University of Nebraska NCTA
Dean's Office
404 East 7th | Curtis, NE 69025 | 308.367.5200 | larry.gossen@unl.edu

University of Nebraska Lincoln

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
DEPARTMENT OF AGRONOMY AND HORTICULTURE

April 15, 2024

Mark Stone, Professor and Dept Head
Biological Systems Engineering
University of Nebraska-Lincoln

Dear Mark,

The Department of Agronomy and Horticulture fully supports the proposed Irrigation and Agricultural Water Management Undergraduate Certificate program. The Department also supports the listing of Soil Resources 153 (PLAS 153) as a required course.

Thank you for the partnership and including PLAS 153 in the certificate.

Sincerely,

Martha Mamo, Professor and Head

Cc – Don Lee
Meghan Sindelar
Anne Streich
Derek Heeren
Deepak Keshwani

202 Keim Hall / P.O. Box 830915 / Lincoln, NE 68583-0915
(402) 472-2811 / FAX (402) 472-7904 / E-mail: AgroHort@unl.edu / Websites: http://agronomy.unl.edu/ and http://hort.unl.edu/

April 15, 2024

Dr. Deepak Keshwani
Department of Biological Systems Engineering
College of Agricultural Sciences and Natural Resources
University of Nebraska-Lincoln

Dear Dr. Keshwani:

I am pleased to offer this letter of support for your proposal of the online undergraduate certificate program in Irrigation and Water Management Certificate Program. On behalf of the Department of Agricultural Economics, I confirm that we will be glad to accept students from the proposed minor into the AECN/NREE 357 Environmental and Natural Resources Law course for the certificate.

We wish you success in the new minor.

Sincerely,

Kathleen Brooks, Ph.D.
Associate Professor and Associate Interim Department Head
Agricultural Economics

University of Nebraska Lincoln
Department of Agricultural Economics
1625 Arbor Drive, Filley Hall 102 | Lincoln, NE 68583-0922 | 402.472.3401 | agecon@unl.edu
agecon.unl.edu

University of Nebraska-Lincoln
New Undergraduate Certificate

I. Descriptive Information

Name of Institution Proposing New Undergraduate Certificate
University of Nebraska-Lincoln
Name of Proposed Undergraduate Certificate
Irrigation and Agricultural Water Management (IAWM)
Other Programs Offered in this Field by this Institution
Undergraduate majors: Agricultural Systems Technology, Agricultural Engineering. Graduate majors: Agricultural Systems Management (MS), Agricultural and Biological Systems Engineering (MS), Biological Engineering (PhD). Graduate specialization: Irrigation and Agricultural Water Management.
CIP Code: 6 digit *[IEA can help with CIP codes or browse here: http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55]*
01.0308
Subject Code: 4 characters
AGST
Primary Administrative Unit for the Proposed Undergraduate Certificate
Biological Systems Engineering (BSE)
All Units Participating in the Undergraduate Certificate
Biological Systems Engineering, Agronomy and Horticulture, Agricultural Economics
Proposed Delivery Site
UNL East Campus
Undergraduate Certificate will be offered *[full program, not individual courses]*
_____ On-campus only _____ Distance only __X___ Both (on-campus and distance)
Undergraduate Certificate will be Offered to
_____ UNL degree seeking _____ UNL non-degree seeking ___X__ Both _____ Other (please explain)
Program leads to licensure or certification
___X__ no _____ yes If yes, explain:
The proposed certificate program is a subset of an existing degree program
__X___ yes _____ no
Percentage of the proposed certificate program made up of existing courses
100%
Proposed Date the New Undergraduate Certificate will be Initiated
Fall 2025

II. Details

Purpose of the Proposed Undergraduate Certificate:

The purpose of the proposed Irrigation and Agricultural Water Management (IAWM) Certificate is to prepare students to be wise managers of irrigation, water resources, and agricultural systems. The primary audience is online, non-degree-seeking students. The online, asynchronous program will be of interest to early- to mid-career professionals in local (e.g., agricultural industry, Natural Resources Districts), national (e.g., KS, CO, CA), and international (Sub-Saharan Africa, MENA, Latin America) markets. Prospective students include high school graduates who want a credential in IAWM, graduates from a community college who want more depth with a junior/senior-level credential in IAWM, and graduates from a university who want a credential specifically in IAWM.

Description of the Proposed Undergraduate Certificate:

The primary learning outcomes IAWM Undergraduate Certificate will be:

- Describe basic watershed hydrology and calculate runoff rates and amounts.
- Describe the impacts of agricultural, urban, and industrial development on watershed hydrology and ecosystems.
- Conduct topographic and profile surveys and collect field data required to characterize watersheds and implement soil and water conservation practices.
- Quantify how tillage, cropping, construction, and structural practices impact soil erosion.
- Calculate crop water use rates in the context of daily irrigation management.
- Measure water flow rates in irrigation pipelines, calculate water application rates and volumes, and calculate water measurement accuracy.
- Describe sprinkler, microirrigation, and surface irrigation systems.
- Perform an irrigation system evaluation, including water application uniformity and application efficiency.
- Apply various irrigation scheduling techniques utilizing current technology and sensing systems for irrigation.
- Describe water management practices for rural watersheds and understand the concepts of basin-wide water management.

The admission criteria will be the same as the general admission requirements for UNL. Since the certificate will be in CASNR, there will not be additional admission requirements at the college level. Applicants who meet the admission criteria will be admitted into the certificate program. Physics (AGST 109) is built into the certificate which will ensure that students are ready for the subsequent core courses. AGST 109 requires college algebra as a prerequisite (MATH 101 or higher). If an applicant has not taken MATH 101 or higher, they can meet this requirement if they place into MATH 102 or higher when taking the UNL Math Placement Exam.

The proposed certificate is 18 credits total, with 8-9 credits at the 100/200 level and 9-10 credits at the 300/400 level. The certificate requires two foundational courses (AGST 109 and PLAS 153), two core courses (AGST 354 and AGST 452), one breadth course on policy (NREE 357), and one credit of experiential learning (AGST 299 or AGST 395).

Required Courses (17 credits)	Major/Degree Credit Hours	Prerequisites, if applicable	Course and Lab Fees
AGST 109 Physical Principles in Ag and Life Sciences	4	MATH 101 (or higher)	
PLAS 153 Soil Resources	4		
AGST 354 Soil Conservation and Watershed Management	3	AGST 109, PLAS 153	
AGST 452 Irrigation Systems Management	3	AGST 109	
NREE 357 Natural Resource and Environmental Law	3		
Experiential Learning Elective (1 credit)			
AGST 299 Career Experiences	1		
AGST 395 Internship in Agricultural Systems Technology	1		
Total	18		

The BSE department will assign an advisor to students when they are admitted to the program. There are no guidelines or accreditations for this certificate, which will be unique nationally and globally. Points of contact for the certificate are Derek Heeren (https://bse.unl.edu/faculty/derek-heeren) and Deepak Keshwani (https://bse.unl.edu/faculty/deepak-r-keshwani). No course subject codes will need to be created or modified.

The primary audience for the proposed certificate will be online, non-degree-seeking students. All courses will be available as online courses. AGST 109, PLAS 153, and NREE 357 already have online (-700) sections available. Online sections will be created for AGST 354 and AGST 452. It is expected that most of these non-degree-seeking students will be working full-time with tuition being paid by the student and/or the employer. A student could complete the certificate online in as little as 12 months if they begin in the spring semester.

Recommended Course Sequence Depending on Time of Entry into the Program.

Starting Point:	Semester				
	Summer	Fall	Spring	Summer	Fall
Summer	AGST 109	PLAS 153 AGST 452	NREE 357	Exp Learning	AGST 354
Fall		AGST 109	PLAS 153 Exp Learning	NREE 357	AGST 354 AGST 452
Spring			AGST 109 PLAS 153	NREE 357 Exp Learning	AGST 354 AGST 452

The certificate will also be available to degree-seeking students. UNL students who are enrolled residential degree programs and majors will be expected to take the courses for the certificate program though in-person course delivery. It is expected that the certificate will be an attractive option for undergraduate students with a major in Agricultural Systems Technology, Agronomy, Agricultural Engineering, or Applied Science. The following substitutions will be available for engineering students: AGEN 350 for AGST 354; AGEN 453 for AGST 452; PHYS 141 or PHYS 151 or PHYS 211 for AGST 109.

III. Review Criteria

A. Centrality to UNL Role and Mission

The need for professionals in Irrigation and Agricultural Water Management is great, yet few universities in the U.S. have maintained educational programs in this field. UNL is well positioned to address this gap with its institutional strengths in agriculture and water, as well as its synergy with Daugherty Water for Food Global

Institute (DWFI). Nebraska has more irrigated acres than any other state and is home to the irrigation industry (the four largest center pivot manufacturers, power units, pumping systems, water conveyance systems, service providers, etc.). As a land-grant university, UNL and BSE have maintained a strong connection with the irrigation industry. The certificate is expected to provide additional visibility for UNL's expertise in Irrigation and Agricultural Water Management and contribute to UNL's international reputation as a leader in agriculture.

B. **Relationship of the proposal to the NU 5-year strategy**

The proposed certificate will address workforce shortages in Nebraska (and abroad), in line with the NU 5-year strategy. The quality of the educational experience and student success will be prioritized. The IAWM Undergraduate Certificate will foster enrollment growth, with an expected 20-40 completions each year. Finally, aligned with UNL's strategy for online programs, the certificate is stackable: if a certificate student chooses to also pursue an undergraduate degree from UNL, the courses from the certificate could be applied toward a major in Agricultural Systems Technology, Agronomy, or Applied Science.

C. Consistency with the Comprehensive Statewide Plan for Post-Secondary Education

The proposed Irrigation and Agricultural Water Management Undergraduate Certificate is aligned with the Coordinating Commission Statewide Plan for Post-Secondary Education. It meets the educational needs of the State of Nebraska, including workforce development and research/technology transfer for the irrigation industry in particular, as well as the agricultural industry and the natural resources management community. The Irrigation and Agricultural Water Management programs are being developed in close partnership with industry and educational institutions in other states.

D. Evidence of Need and Demand

There are currently not enough students interested in irrigation to meet the workforce needs of the irrigation industry in Nebraska (and nationally). Globally, there is a need for online education in irrigation, especially agricultural irrigation, for those entering the workforce. The undergraduate certificate will provide an educational pathway for students to gain a credential in this area without committing to a degree program. DWFI will be a key partner in promoting the certificate through its global networks.

This certificate will be unique nationally and globally. There is not an irrigation certificate available at the undergraduate junior/senior level, either in-person or online. In-person certificates in agricultural irrigation at the community college level are available through the Nebraska College of Technical Agriculture (https://ncta.unl.edu/irrigation-technician-certificate) and the College of the Sequoias (https://catalog.cos.edu/areas-study/agricultural-technology/skill-certificate-irrigation-mgmt/ and https://catalog.cos.edu/areas-study/agricultural-technology/skill-certificate-irrigation-construction-installation/). The proposed Irrigation and Agricultural Water Management Undergraduate Certificate is intended to be a value-added opportunity for community college students; it is not expected to be competitive with community college programs.

E. Avoidance of Unnecessary Duplication

There is currently no similar certificate at UNL at the undergraduate junior/senior level. NCTA has an Irrigation Technician Certificate at the community college level. The proposed Irrigation and Agricultural Water Management Undergraduate Certificate will be complimentary to community college programs.

F. Adequacy of Resources:

All courses in the proposed certificate are already offered. No additional resources from the university are required to start this program

Response to Reviewer Comments

Irrigation and Agricultural Water Management Undergraduate Certificate

Reviewed by APC

10/2/2024

Course Content and Learning Outcomes: The learning outcomes are ambitious, and the credit load of 18 hours may be challenging for part-time, non-degree students to complete within a year. The description of more flexible options for completion in the table provided is appreciated, and these options could make the program more attractive and accessible to professionals who might not have the time to manage a full credit load each semester. *Please identify which learning outcomes depend on NREE 357 and describe how each course contributes uniquely to the learning objectives. Please provide letters of support from the Departments of Agronomy and Horticulture and Agricultural Economics.*

Response: The option to complete the certificate in a 12-month timeline was developed based on feedback from the EVC's office, which is attractive to some potential students. We have letters of support from both departments which are attached to this response. They were inadvertently left out of the original proposal. The connection between learning outcomes and courses is provided here:

- ***Describe basic watershed hydrology and calculate runoff rates and amounts. (AGST 109, PLAS 153, AGST 354)***
- ***Describe the impacts of agricultural, urban, and industrial development on watershed hydrology and ecosystems. (AGST 354, NRES 357)***
- ***Conduct topographic and profile surveys and collect field data required to characterize watersheds and implement soil and water conservation practices. (AGST 109, PLAS 153, AGST 354)***
- ***Quantify how tillage, cropping, construction, and structural practices impact soil erosion. (PLAS 153, AGST 354)***
- ***Calculate crop water use rates in the context of daily irrigation management. (AGST 452, NRES 357)***
- ***Measure water flow rates in irrigation pipelines, calculate water application rates and volumes, and calculate water measurement accuracy. (AGST 109, AGST 452)***
- ***Describe sprinkler, microirrigation, and surface irrigation systems. (AGST 109, AGST 452)***

- ***Perform an irrigation system evaluation, including water application uniformity and application efficiency. (AGST 109, PLAS 153, AGST 452)***
- ***Apply various irrigation scheduling techniques utilizing current technology and sensing systems for irrigation. (AGST 109, AGST 452)***
- ***Describe water management practices for rural watersheds and understand the concepts of basin-wide water management. (AGST 354, AGST 452, NRES 357)***

Admission and Prerequisites: There may be a potential barrier to entry for students who have not taken MATH 101 or higher, as it is required for AGST 109. While the proposal mentions that students can meet this requirement via a placement exam, it might deter students without recent math experience, particularly the target audience of mid-career professionals. *Please provide information about the placement exam (e.g., How often and how offered? This will be helpful for working professionals) and provide a recommended course sequence for students who need MATH 101*.

Response: For those unfamiliar with undergraduate programs at UNL, the math placement exam is offered online by the mathematics department and can be taken by students anytime. The placement exam is required for most students who are admitted to UNL in any undergraduate program (https://nse.unl.edu/advising/pre-advising/math-placement-exam/). For students who do not meet the threshold for the course per the MPE or those that do not have prior math coursework, they will be advised to complete the pre-requisite math course prior to starting the certificate program. While UNL does not offer math courses online, many community colleges do. Our advisers will work with the students to identify options to complete the prerequisite math course.

Program Viability and Resources: Although the financial model seems sound, the enrollment projections may be optimistic. The proposal does not clearly outline a marketing or recruitment strategy for reaching non-degree-seeking professionals in the agriculture and irrigation sectors, particularly on a global scale. The Daugherty Water for Food Global Institute is mentioned as a partner for promotion, but further details would strengthen this section. *Please provide a letter from DWFI confirming their role in promoting the proposed certificate. Also note that the current proposal states that `There are currently not enough students interested in irrigation to meet the workforce needs of the industry in Nebraska (and nationally)'. As such, what is the unmet student demand?*

Response: A letter from DWFI has been added.

Program Delivery and Flexibility: The asynchronous online format is appealing for working professionals, but there is a lack of detail on how student engagement and support will be maintained in an entirely online program, and if at all it equates with the in-person delivery. *Please provide more detail on how courses will be developed for online delivery with appropriate engagement and support, and confirm that sufficient resources exist to make this happen*.

Two of the courses in the certificate program (AGST 354 and 452) have not previously been available online. The faculty and staff in the Biological Systems Engineering Department are currently developing online versions of these two courses including video capture of laboratory activities through the work of our department's communication specialist. We are seeking the help of instructional designers assigned to the College of Agricultural Sciences and Natural Resources and the College of Engineering for course design. The faculty teaching these courses are being guided by faculty in BSE who have experience teaching online courses. We don't need additional resources to develop online versions of these classes which will be available starting Fall 2025.

The Biological Systems Engineering department has a BSE Student Services Team that includes a faculty director of undergraduate programs, two professional advisers, and a recruiter. This team is available to support students in the program from the point of entry to completion. The team will support these learners should they have any challenges in their courses just as they are supporting degree seeking students in our program. We have adequate capacity in our student services team to meet the needs of the certificate students in addition to our degree seeking students.

Additionally, BSE department faculty have been teaching online courses for many years (AGST 109, AGST 362, BSEN 206). We have experience in supporting remote learners and routinely engage with instructional designers on campus from CTT and the UNL Engineering and Computing Education Core on best practices for online learning.

Alignment with Institutional Strategy: No major concerns here, though the proposal could benefit from a more explicit mention of how the program will contribute to diversity, equity, and inclusion (DEI) initiatives, particularly given its international aspirations.

Response: Irrigation and water management has a lot of global relevance given the effects of a changing climate. We anticipate this certificate will be of interest to a range of learners both locally and globally. The BSE department has also embraced the ecology of validation framework in all our teaching and learning activities. This framework, which is the basis of UNL's Promoting At-Promise Student Success or PASS, refers to a validating campus culture and strategies that faculty and staff can use to support undergraduates' persistence, degree completion, and career development, particularly those who have been historically underserved.

Final Thought: The proposal is solid and addresses a real need in the field of irrigation and agricultural water management. However, to ensure its success, APC should consider addressing the concerns related to **the balance between degree and non-degree students, potential barriers to entry, enrollment and marketing strategies, and the provision of student support services for online learners.**

Response: Developing programs for non-degree students is a way for us to adapt to serve a broader range of learners in the midst of a changing higher ed landscape and is part of a plan for increase tuition revenue. Barriers to entry, marketing, and student support are addressed in the above responses.

TABLE 1: PROJECTED EXPENSES - NEW INSTRUCTIONAL PROGRAM

	FY2025-26 Year 1		FY2026-27 Year 2		FY2027-28 Year 3		FY2028-29 Year 4		FY2029-30 Year 5		**Total**	
Personnel	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost	**FTE**	**Cost**
Faculty											0	$0
Professional											0	$0
Graduate assistants											0	$0
Support staff											0	$0
Subtotal	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Operating												
General Operating												$0
Equipment												$0
New or renovated space												$0
Library/Information Resources												$0
Other		$0		$0		$0		$0		$0		$0
Subtotal		$0		$0		$0		$0		$0		$0
Total Expenses	0	$0	0	$0	0	$0	0	$0	0	$0	**0**	**$0**

CCPE; 11/19/08

TABLE 2: REVENUE SOURCES FOR PROJECTED EXPENSES - NEW INSTRUCTIONAL PROGRAM

	FY2025-26	FY2026-27	FY2027-28	FY2028-29	FY2029-30	
	Year 1	Year 2	Year 3	Year 4	Year 5	**Total**
Reallocation of Existing Funds						$0
Required New Public Funds						$0
1. State Funds						$0
2. Local Tax Funds (community colleges)						$0
Tuition and Fees [1]	$24,120	$48,240	$72,360	$96,480	$96,480	$337,680
Other Funding						$0
Total Revenue	$24,120	$48,240	$72,360	$96,480	$96,480	$337,680

[1] Tuition only based on enrollment projection chart below.

Enrollment Projection

Year	Number of students	Credit hours per student	Tuition rate per credit hour	Total Revenue
FY2024-25	0	0	$ 268	$ -
FY2025-26	5	18	$ 268	$ 24,120
FY2026-27	10	18	$ 268	$ 48,240
FY2027-28	15	18	$ 268	$ 72,360
FY2028-29	20	18	$ 268	$ 96,480
FY2029-30	20	18	$ 268	$ 96,480

CCPE; 11/19/08

May 8, 2024

Dr. Mark Stone
Department of Biological Systems Engineering
University of Nebraska-Lincoln

RE: Letter of Support – Irrigation and Agricultural Water Management Program

Dear Dr. Stone:

I am pleased to offer this letter of support for the proposal for the online certificate program in Irrigation and Agricultural Water Management (IAWM) through the Department of Biological Systems Engineering at the University of Nebraska-Lincoln. The certificate will prepare students to be effective managers of irrigation systems. This online program will be particularly valuable to students who are not pursuing a 4-year degree but want to acquire skills in this area.

In particular, the program would be a valuable personal development resource for individuals looking to enter or advance their career with irrigation equipment suppliers and distributors. This is a skillset that is shrinking in availability in the talent marketplace today, while at the same time we see the need for these skills in the talent marketplace continuing to grow in the years ahead.

Feel free to reach out to me if you have any questions.

Best regards,

Brian Magnusson

Brian Magnusson
Senior Vice President, Strategy and Business Development

Irrigation Company

Like No Other

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P.O. Box 1047
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July 1, 2024

Dr. Mark Stone
Department of Biological Systems Engineering
University of Nebraska-Lincoln

Dear Dr. Stone:

I am pleased to offer this letter of support for the proposal for the online certificate program in Irrigation and Agricultural Water Management (IAWM). The certificate will prepare students to be effective managers of irrigation systems. This online program will be particularly valuable to students who are not pursuing a 4-year degree but want to acquire skills in this area.

For T-L Irrigation Co., the IAWM program is appealing for training for our District Sales Managers and possibly our dealers that are located around the U.S. and the world, so the online aspect will be a good fit. The irrigation and water management focused courses will provide a solid foundation for our DSM's and dealers to incorporate and integrate their learning with the application of our mechanized irrigation systems.

Feel free to reach out to me if you have any questions.

Regards,

Neal
Neal Schlautman
Engineering Manager
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THE DAUGHERTY WATER for FOOD GLOBAL INSTITUTE at the University of Nebraska

TO: Academic Planning Committee Chairs

FROM: Peter G. McCornick, Executive Director

DATE: October 17, 2024

SUBJECT: Proposal to Create an Undergraduate Certificate in Irrigation and Agricultural Water Management

I am pleased to support the proposal to create a new Undergraduate Certificate in Irrigation and Water Management (IAWM). Since its founding at the University of Nebraska in 2010, the institute has grown to become a globally influential research organization focused on improving water management in agricultural and food systems. Partnerships are key to our success. Our global professional network allows us to facilitate, convene, and lead multiple strategic partnerships and creative collaborations. Our worldwide collaborators include local, state, and national government agencies, multilateral organizations, for-profit and nonprofit private-sector enterprises, and educational and research institutions.

The IAWM program supports DWFI's strategic direction, creating a pipeline of talented professionals while also building capacity in IAWM industries and partner organizations. To support and facilitate IAWM program awareness and engagement, DWFI will leverage our existing communications and convening activities. For example, DWFI's conference consistently brings together local to global participants. In 2023, more than 120 speakers and 400 participants from 27 different countries gathered to discuss innovative ways to improve water and food security. DWFI's next global conference will be held April 28 – May 2, 2025. DWFI's electronic and social media, especially LinkedIn, will be helpful in sharing information about the IAWM program. Another recent example of DWFI's communications capacity is its support for the U.S. Agency for International Development Feed the Future Innovation Lab for Irrigation and Mechanization Systems (ILIMS). The international networks developing as part of the ILIMS project will provide the IAWM program a source of potential students.

Please contact me if you have any questions or would like additional information about DWFI's programming.

Peter G. McCornick, Ph.D., P.E., BC.WRE
Executive Director, Daugherty Water for Food Global Institute

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