From:	Smith, Randy
To:	Gerber, Carri; Osborne, Jeanne
Cc:	Leite, Fabio; Reed, Katie; Smith, Randy; Duffy, Lisa; Orr, James; Boone, Kristina M.; Christy, Ann
Subject:	Proposal to establish an undergraduate certificate in Feed Mill Operations
Date:	Thursday, November 2, 2023 10:27:46 PM
Attachments:	image001.png

Carri and Jeanne:

The proposal from Ohio State ATI to establish an undergraduate certificate (type 1a) in Feed Mill Operations was approved by the Council on Academic Affairs at its meeting on November 1, 2023. Thank you for attending the meeting to respond to questions/comments.

No additional level of internal approval is necessary. This action will be included in the Council's next Annual Activities Report to the University Senate (July 2024).

The Office of the University Registrar will work you with any implementation issues.

Please keep a copy of this message for your file on the proposal and I will do the same for the file in the Office of Academic Affairs.

If you have any questions please contact the Chair of the Council, Professor Fábio Leite(.11), or me.

I wish you success with this important program development.

Randy

THE OHIO STATE UNIVERSITY

W. Randy Smith, Ph.D.
Vice Provost for Academic Programs
Office of Academic Affairs
University Square South, 15 E. 15th Avenue, Columbus, OH 43201
614-292-5881 Office
smith.70@osu.edu
Assisted by:
Katie Reed
Executive Assistant
(614) 292-5672
reed.901@osu.edu

From:	Osborne, Jeanne
To:	Smith, Randy
Cc:	Reed, Katie; Violet, Cynthia A.; Meadows, Kendyl; Barker, David; Gerber, Carri
Subject:	Requesting CAA Approval for Type 1A Undergraduate Academic Certificate - Feed Mill Operations
Date:	Monday, October 16, 2023 11:00:24 AM
Attachments:	Feed Mill Operations Certificate.pdf image001.png

Dear Dr. Smith,

The College of Food, Agricultural, and Environmental Sciences is requesting Council on Academic Affairs approval for a new Type 1A Undergraduate Academic Certificate – Feed Mill Operations, as outlined in the attached proposal.

The primary impetus for the development of this stand-alone Undergraduate Academic Certificate is the need for skilled Feed Mill Operators in the State of Ohio and this region of the country. The CFAES Agricultural Technical Institute (ATI) developed this certificate and the associated new courses (currently at the OUR pending final approval) in response to industry need and in consult with professionals serving this industry. The Wooster campus and ATI are uniquely positioned to provide this training with the expertise and facilities (including a fully operational Feed Mill) located on the campus.

This proposal has been approved by the Academic Affairs Committee of CFAES ATI, and by the CFAES Committee on Academic Affairs. Please let me know if any additional information is needed in support of this request.

Sincerely,

Jeanne

THE OHIO STATE UNIVERSITY

Jeanne M. Osborne | *Pronouns: She, Her, Hers*
Assistant Dean for Academic Affairs
College of Food, Agricultural, and Environmental Sciences
100E Agricultural Administration, 2120 Fyffe Rd.
Columbus, OH 43210
Tel: 614-292-1734
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e-mail: Osborne.2@osu.edu

'Unexpected kindness is the most powerful, least costly, and most underrated agent of human change' (Bob Kerrey)

THE OHIO STATE UNIVERSITY

College of Food, Agricultural, and Environmental Sciences

CFAES Wooster / Ohio State ATI

1328 Dover Road
Wooster, OH 44691-4000

330-287-1331 Phone
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April 21, 2023

Jeanne Osborne
Assistant Dean for Academic Affairs
100E Agricultural Administration Building
2120 Fyffe Rd.
Columbus, OH 43210

Re: Proposal for Type 1A Certificate in Feed Mill Operations

Dear Ms. Osborne:

Enclosed please find the proposal for a Type 1a Certificate in Feed Mill Operations submitted for consideration by the FAES Committee on Academic Affairs.

The proposal was developed over several years by committee at Ohio State ATI in response to industry need.

Three courses were developed to support the certificate:

- ENGTECH 2061T: Feed Mill Operations and Quality Assurance
- ENGTECH 2062T: Feed Technology, Formulation, and Safety
- ENGTECH 2189T: Feed Mill Practicum

Please let me know if there are questions or additional information or documentation is required to accompany this submission. We look forward to hearing from the FAES Committee on Academic Affairs regarding next steps in the approval process.

Sincerely,

Carri A Gerber

Carri A. Gerber
Assistant Director, Academic Affairs
CFAES Wooster – Ohio State ATI

I. Well-defined Program

A. Title of the program

Feed Milling Operations

B. Certificate category and justification

Type 1a certificate

The type 1a certificate is appropriate for the number of credits needed to provide a foundation in feed milling. In addition, the 1a certificate will be delivered on the CFAES Wooster campus and will provide complementary additional credential for students enrolled in other Ohio State ATI programs. The certificate will provide feed milling credentials for students seeking employment in the feed industry.

C. State purpose of program

Members of the agriculture industry have expressed to Ohio State ATI the need for employees who have an educational background in feed milling. Thus, a stakeholder survey was conducted to determine if the need was industry wide. From that survey it was determined there was interest across the industry. So, Ohio State ATI convened an industry focus group which provided feedback and input on the semester-by-semester plan and syllabi.

The Certificate in Feed Milling is designed to provide a foundation in animal feed milling technology. The objectives of the certificate are for the student to: acquire an understanding of the function of a modern feed mill; to learn procedures to assist in operating a feed mill; and to apply academic skills to the challenges of operating a manufacturing facility.

The curriculum is designed with stakeholder input and to provide students both theoretical and practical knowledge, as well as the requisite technical skills necessary to enter and thrive in the industry upon graduation. The program will provide students opportunities to participate in plant operation; and, as a result of the in-class and practical learning experiences, graduates will gain the skills and abilities to enter the feed milling industry.

This certificate will be delivered in-person.

D. Are multiple methods of delivery available concurrently?

No

E. Date the program would become effective, if approved

Autumn 2024

F. Program goals

The goal of the program is to provide a foundation in animal feed milling technology.

G. Expected learning outcomes supporting the program goals

Upon completion of the certificate, the graduate will be able to[1]

- Acquire an understanding of the function of a modern feed mill,
- Learn procedures to assist in operating a feed mill,
- Apply academic skills to the challenges of operating a manufacturing facility.

Assessment Measures

Faculty members responsible for these courses will meet annually to assess and potentially recalibrate assignments and course content to better meet program learning goals. The content of these annual meetings will be informed by the following program indirect and direct assessment measures:

Indirect Measures:

- Number of applicants to the program: Analyzing quantitative patterns of total number of applicants across each academic year;
- Student evaluation of instruction: Measuring student satisfaction for individual courses/instruction.

Direct Measures

- Assessment measures will be developed, integrated into course assignments, and deployed in line with the program objectives.

H. Minimum requirements to complete program, including off-campus field experiences

A minimum of thirteen credit hours, which includes 1 hour of practicum, is required to complete the certificate. The practicum will be completed at the CFAES Feed Mill. The required courses must be successfully completed within 5 years of starting the program. The certificate needs to be declared at least one semester before graduation.

I. Table showing the number of credit hours that can be achieved: i. in-person only ii. online only iii. in-person or online

Method of delivery	Credit Hours
In person only	13
Online only	0
In-person or online	0

J. For programs in which 50% of the credits may be achieved online, an MOU with ODEE is needed

Not applicable

K. List of required courses and elective courses

Category	Requirement	Credit Hours
Required Core Course	ANIMSCI 2200.01 – Introductory Animal Sciences	3 credits
Required Core Course	2061T – Feed Mill Operations and Quality Assurance	3 credits
Required Core Course	2062T – Feed Technology, Formulation, and Safety	3 credits
Required Core Course	ANMLTEC 3131T Equine Feeding and Nutrition, ANMLTEC 3132T Ruminant Feeds and Feeding, ANMLTEC 3133T Practical Swine Feeding, or ANMLTEC 3137T Dairy Cattle Feeding Management	3 credits
Required Core Course	ENGTECH 2189T – Feed Mill Practicum	1 credit
Recommended Supporting Course	ASM 3330 Grain Handling, Drying, and Milling	3 credits

Semester 1

1. ANIMSCI 2200.01 Introductory Animal Science – 3 credits
2. ENGTECH 2061T Feed Mill Operations and Quality Assurance – 3 credits (includes a lab)

Semester 2

3. ENGTECH 2062T Feed Technology, Formulation, and Safety – 3 credits
4. ANMLTEC 3131T Equine Feeding and Nutrition, ANMLTEC 3132T Ruminant Feeds and Feeding, ANMLTEC 3133T Practical Swine Feeding, or ANMLTEC 3137T Dairy Cattle Feeding Management – 3 credits.

Semester 2 or 3

5. ENGTECH 2189T Feed Mill Practicum – 1 credit

Recommended, but not required

6. ASM 3330 Grain Handling, Drying, and Milling – 3 credits
   Prereq: Math 1130, 1131, 1148, 1149, 1150, or 1151

Opportunity for electives
Within the thirteen required hours there are no elective choices. However, by keeping the number of credit hours required for the certificate low, students will have the opportunity to pursue other majors and credentials or supplement with additional courses of interest. The certificate is designed to be completed over two semesters by taking 6 – 7 credit hours each semester. If the student desired to be a full-time student, he/she would have the opportunity to take an additional 6 to 12 credit hours of elective coursework.

L. Length of program compared to similar programs

This certificate can be completed in two semesters which is in line with other Type 1a certificates at The Ohio State University. This is also in line with the few other University feed milling programs. North Carolina State University offers an undergraduate certificate in Feed Milling which is comprised of 12 credits (5 courses). Iowa State University offers a Feed Technology minor which consists of 15 credit hours.

II. Adequate Enrollment

A. Projected enrollment (include justification for estimate)

Since there is not a similar program in or near Ohio, we anticipate enrollment will be good. During the industry focus group held at Ohio State ATI, Dr. Charles Stark mentioned that the Kansas State bachelor's degree program has about 40 – 50 students enrolled. Therefore, we feel our estimates are reasonable for this certificate program especially since this certificate could easily be completed with one of the associate degrees offered at Ohio State ATI.

Year 1	Year 2	Year 3	Year 4	Year 5
10	10	10	15	20

Too many students? There is always a risk for too many students – this would be a great problem. The practicum course would have the largest challenge with too many students; however, since individual students are limited to 30 to 50 hours per practicum credit and the CFAES feed mill is a fulltime operation, this should not be an issue. If needed, practicum experiences may be available at other local feed mills. "Too many students" improves the economics of offering the program – more students to pay the cost of teaching the 3 courses and promoting the program.

Too few students? A certain number of students is necessary to pay for the cost of teaching the 3 program specific courses. Like all new ventures, there is a risk in not getting enough "sales" to pay for the program.

B. Opportunities for graduates

A survey of the feed mill industry conducted in 2019 demonstrated demand in this field.

> "Respondents reported new hire salaries of $33,379 with benefits packages worth $11,621 on average. Most (55%) respondents indicated it was difficult or very difficult to fill entry level positions. Respondents (n=34) also indicated that there were 1±1.9 (average±SD) positions available per company per year at the bachelor's degree level and 2±4.1 positions available at the associate's degree level." There is a need for employees with specific skills, knowledge, and abilities to support the feed mill industry across the United States. (Mastellar, S. L., Hostetler, K. M., Foltz, J. C., & Mann, A. J. (2020). Evaluating need and specific skills desired by industry for a feed mill program via survey. NACTA Journal, 64.)

According to The American Feed Industry Association (www.afia.org), there are more than 5800 animal food manufacturing facilities in the United States which provide more than 944,000 jobs. In Ohio there are just under 55,000 jobs in this industry. Thus, there would be many opportunities within the industry for graduates of this certificate program.

Goals of enrollees

Students enrolled in this program will most often be interested in increasing their skill set in the feed industry. This could also hold true for individuals already employed in the industry who require additional training or retraining for their employment. Additionally, Ohio State ATI students may also desire to add this certificate to complement their associate degree and increase their employability after graduation. The feed milling certificate may be enticing to Ohio State ATI students who have transfer and College Credit Plus credits and need additional credits to be full-time, and students who need extra semesters to complete their associate degree.

C. Minimum requirements to undertake program of study; admissions policy

Interested students who have been admitted to Ohio State ATI will be eligible to enter the Feed Milling Operation certificate upon admission. The admission policy of the Wooster campus is the same as for the regional campuses of The Ohio State University (see: https://ati.osu.edu/futurestudents/future-freshmen/admissions-requirements).

It is anticipated that some students may elect to complete the certificate in addition to completing an Associate of Applied Science or Associate of Science degree at Ohio State ATI. In this case the certificate would need to be declared at least one semester before graduation.

III. Sufficient Resources

A. Adequacy and availability of facilities and staff, including off-campus field experience sites

Facilities

The proposed program utilizes resources available on the CFAES Wooster campus of The Ohio State University. Therefore, there is no additional equipment requirement towards the establishment of this program, nor will there be additional costs to Ohio State ATI. Students will complete their practicum at the CFAES Feed Mill.

The CFAES Feed Mill is a "state-of-the-art Feedstock Processing Research Facility, or Feed Mill, that provides the quality, nutritional value and precision mixing of feeds needed to support internationally recognized CFAES livestock and poultry research programs. The ability of Feed Mill staff to produce specialty diets according to exact specifications on-site boosts the quality of research and gives scientists a competitive edge to attract grants. Students receive hands-on experience as they learn about feed and grain handling in the field of animal nutrition. The facility has the ability to handle 8,000 tons of feed per year.

The Feed Mill supports the work of researchers in the Department of Animal Sciences; the Department of Food, Agricultural and Biological Engineering; the Food Animal Health Research Program; as well as the Ohio State ATI. It produces over 200 different rations; both general herd rations and experimental diets for the livestock and poultry operations on the Wooster and Columbus campuses and at three outlying agricultural research stations throughout the state. Feed Mill staff assist CFAES faculty, staff, and students with developing feed ration formulas and procuring feed ingredients not normally stocked in the Feed Mill inventory. They also assist animal facility managers with feed handling problems." (excerpt from website https://researchoperations.cfaes.ohio-state.edu/wooster-ag-facilities/feed-mill)

Faculty/Staff

An Ohio State ATI faculty member is needed to oversee the program as the program coordinator for the certificate. The faculty member will need the academic and industry expertise, experience, and credentials to develop the two new courses, teach the specific feed milling courses, oversee the student practicum experience, and provide students with knowledge and skill development in feed milling. Based on the proposed academic schedule, the faculty member would teach one course and supervise the student practicum each semester resulting in approximately 5 to 7 student contact hours per week each semester. This is approximately a 40 to 50 percent faculty load at Ohio State ATI. In addition, the faculty program coordinator would be responsible for promoting the program, assessing the quality of the program, developing industry relationships, and further program development.

B. Projected resource needs and plans to meet those needs

The largest need is a faculty member to teach the required new courses and supervise the certificate program. Industry is very interested in having this program available. Due to the expressed interest and support of a feed milling program at Ohio State ATI, OSU Advancement is working on a lead to provide support for a position. If outside funding sources are not acquired, funding would need to come from the ATI budget.

Since the faculty position is less than full-time, the faculty member could also be involved in the management and operation of the CFAES Feed Mill. The CFAES Feed Mill has need for additional employees to manage and operate the feed mill. Ohio State ATI will seek support from the Wooster Campus Operations to support funding for a combination full-time position. Furthermore, Ohio State ATI could seek a split appointment with Animal Science; Food, Agricultural, and Biological Engineering; or Extension.

IV. Justifiable Expenses

A. Additional faculty

The primary expense for Ohio State ATI is the salary for the faculty member to teach the courses and lead the program. If a full-time lecturer position, instead of a tenure-track position, is used, the projected starting salary should range between $65,000 and $85,000 based upon other lecturer positions in the Ohio State ATI Agricultural and Engineering Division. Only 50% of the full-time lecturer position is needed to support the Feed Milling Operations certificate resulting in a cost estimate of $32,500 to $42,000 to the program. However, the competitive salary in the feed milling industry seems to be higher than the salary range mentioned above – the salary cost estimate may need to be higher.

The projected lecturer salary is much lower than the salaries listed for the full professors listed in the below table.

Publicly available salaries of faculty in this field:

Name (Link to CV)	**Title**	**Salary (Link to salary database)**
Moritz, Joseph	Full Professor of Poultry Science State Extension Specialist Feed Manufacture and Poultry Science	$152,308.03
Stark, Charles	Jim and Carol Brown Associate Professor of Grain Science & Industry and Faculty Coordinator of the O.H. Kruse Feed Innovation Technology Center	$163,323.86

B. Course additions or deletions

Additions: Two new feed mill courses and a practicum. These courses will be developed by the Agricultural and Engineering Technologies Division at Ohio State ATI. They will then go through the standard approval process of the University.
Deletions: None.

C. Necessary budget adjustments

No budgetary adjustments are needed at this time.

D. Available and anticipated funding

General funds will support the position from SIS and tuition. In addition, we will be seeking funds from donors supportive of the program.

V. Adequate Demand

A. Evidence of sufficient demand by students, faculty, general public, and/or business

Student interest in feed industry careers as reported by South Dakota State University Animal Science freshman on a Likert scale was on average, moderate (Mastellar et al., 2019). There is high interest from industry to have employees with specific training in feed milling. According to the survey conducted by The Ohio State University faculty, survey respondents (n=34) indicated that there were 1±1.9 (average±SD) positions available per company per year at the bachelor's degree level and 2±4.1 positions available at the associate's degree level. There is a need for employees with specific skills, knowledge, and abilities to support the feed mill industry across the United States. The stakeholder survey conducted demonstrates this demand from employers and as this need for feed mill workers increases, the demand for the certificate program should also increase.

B. Duration of demand (long/short term)

There will always be a need for animal feed, so demand for this program will be long term.

C. Ability of other programs to meet demand

Graduates of animal sciences or other ag programs are often hired in this industry due to a lack of availability of graduates with a feed mill specific education. These programs do not provide a focus on feed milling so they are not fully meeting the demand of the industry. The proposed feed milling certificate will uniquely meet this demand.

VI. Competitiveness with other Institutions: Limited Overlap within the University

A. Overlap with other programs or departments (include letters of interest or objection)

The Animal Sciences Department and the Food, Agricultural, and Biological Engineering Department have courses that support this certificate program. However, they do not supply all the needed curriculum content for feed milling operations. Their letters of support are included in the appendix.

B. Duplication of effort by other areas in the University, another university, or another school

There is no duplication of effort within the university. Food, Agricultural and Biological Engineering does teach a course in feed milling that is recommended as an elective in the Feed Milling Operations certificate. There does not appear to be any other feed milling certificate programs in Ohio.

C. Similar programs at other universities in Ohio or in the United States and their levels of success

Other institutions have feed milling programs, but there are none in Ohio.

Institution	Type of program	Link
Kansas State	Bachelor's in Feed Science and Management	https://www.k-state.edu/academics/majors-programs/feed-science-management-degree/
Iowa State	Feed Technology minor in the Department of Agricultural and Biosystems Engineering	https://www.abe.iastate.edu/feed-technology-minor/
North Carolina State University	Online or on-campus 12 credit Undergraduate Certificate for non-degree seeking students	https://online-distance.ncsu.edu/program/university-certificate-in-feed-milling/
North Carolina State University	Feed Milling minor in the Department of Poultry Science	http://catalog.ncsu.edu/undergraduate/agriculture-life-sciences/poultry-science/feed-milling-minor/#text

Graduates of the Kansas State program are in high demand according to Dr. Charles Stark.

Footnotes:[1] Learning goals: Charles Stark at Kansas State University provided the learning goals – similar to Kansas State University's objectives.

Feed Mill Certificate Funding

The Feed Mill certificate is positioned to be self-supporting through prudent financial practices, resource optimization, and anticipated funding mechanisms.

Several key factors contribute to this optimistic outlook:

1. Cost-Efficient Resource Utilization
    a. The primary cost for this type of program is the feed mill. We are fortunate to have an existing/running state-of-the-art feed mill available on the CFAES Wooster campus, which eliminates the need for equipment and facilities.

2. Faculty/Program coordinator
    a. Initially, the milling classes will be staffed by associated faculty.
        i. Ohio State ATI uses a fiscally responsible approach to hiring “one off” instructors – we only hire when enrollment covers the cost. This strategy ensures that the revenue generated from student enrollments will be directly tied to faculty salaries, thus creating a self-sustaining model.
    b. Once the program is up and running (about three years), we will hire a faculty member (tenure track or professional track), which will be a split appointment between Ohio State ATI and the CFAES Wooster feed mill facility; thus the burden of SSI/tuition will be half the salary/benefits.

3. New Courses
    a. While the program introduces two new feed mill courses and a practicum, these additions are expected to be fully funded through tuition revenue (see faculty above.)
        i. The practicum course offers an unintended cost savings – students in the course will reduce the need for employees at the feed mill. This will allow for more production for longer periods.

4. Sources of Funding
    a. SSI and tuition
    b. Industry
        i. The CFAES Development Team has been approached by the grain industry as sponsors of this program. Their commitment will be solidified once the program is available.