

Request to Establish New Academic Minor Program

University: University of Arizona

Name of Proposed Academic Minor Program: Food Science and Fermentation						
Academic Department: School of Nutritional Sciences and Wellness, College of Agriculture, Life and Environmental Sciences						
Geographic Site: Tucson – Main,						
Instructional Modality: In person						
Total Credit Hours: 19						
Proposed Inception Term: Fall 2025						
Brief Program Description: The Undergraduate Food Science and Fermentation Minor explores the processing, regulation, health, safety, innovation, and marketing of consumer foods and beverages. Classes include delivery of foundational knowledge and hands-on applications through a range of faculty-mentored labs. Focal areas for learning include product development, nutritional analysis and food label development, design of experiments, sensory evaluation, microbiology, and the culinary exploration of novel foods. The Minor can complement and reinforce a range of majors from Chemistry, Biology, Microbiology, Engineering, and Business to provide a valuable window into the science and operational foundations of the food and beverages industry. Internships and Directed Research are highly recommended as part of this Minor.						
Learning Outcomes and Assessment Plan: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="padding: 5px;"> Learning Outcome #1: Design food research experiments to test out theories from hypotheses to conclusions. </td> </tr> <tr> <td style="padding: 5px;"> Concepts: The scientific process includes the design of experiments that can be applied to create and optimize food and beverage products. </td> </tr> <tr> <td style="padding: 5px;"> Competencies: Conduct a literature review by synthesizing peer-reviewed scientific articles and then design an experiment to test out a generated hypothesis. </td> </tr> <tr> <td style="padding: 5px;"> Learning Outcome #2: Apply effective communication skills to share knowledge, ideas, and recommendations to accomplish goals and build relationships within the food and beverage community. </td> </tr> <tr> <td style="padding: 5px;"> Concepts: Best practices in developing technical abstracts, posters, and presentations to share with the food community. </td> </tr> <tr> <td style="padding: 5px;"> Competencies: Present scientific data in a clear concise way to share information effectively. </td> </tr> </table>	Learning Outcome #1: Design food research experiments to test out theories from hypotheses to conclusions.	Concepts: The scientific process includes the design of experiments that can be applied to create and optimize food and beverage products.	Competencies: Conduct a literature review by synthesizing peer-reviewed scientific articles and then design an experiment to test out a generated hypothesis.	Learning Outcome #2: Apply effective communication skills to share knowledge, ideas, and recommendations to accomplish goals and build relationships within the food and beverage community.	Concepts: Best practices in developing technical abstracts, posters, and presentations to share with the food community.	Competencies: Present scientific data in a clear concise way to share information effectively.
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Learning Outcome #3: Apply and demonstrate applications of the principles of product development including selection of ingredients, food additives, use of FDA regulations, processes, nutritional considerations, sensory and microbial analysis, and project management to create timely results that can be demonstrated, communicated and defended in front of Food Science and Nutrition experts in a public forum

Concepts: The importance of ingredient selection, regulation adherence, process determination and in-process and finished product analysis.

Competencies: Develop food products/product concepts particularly those with a target of improved health benefits with consideration of ingredient selection, nutritional guidelines, process steps, and finished product specifications within a structured product development project and timeline.

	NSC170C2	NSC353 or NSC351R	ALC422 or NSC260	NSC371R	NSC371L
LO #1: Use design of experiments to test out theories from hypothesis to conclusions.	I		R	M	M
LO #2: Share knowledge, ideas, and recommendations to accomplish goals and build relationships.		I	M	R	R
LO #3: Demonstrate knowledge of food ingredients, food regulations, food processes and analysis.	I	M		R	R

Projected Enrollment for the First Three Years:

	1 st Year	2 nd Year	3 rd Year
Number of Students	5	10	15

Evidence of Market Demand:

A Lightcast Q1 2024 Data Set accessed in March of 2024 showed a projected occupational growth for Food Scientists and Technologists of 34.55% from 2022-2032 with median earnings of \$31.95 per hour (\$66,456 annually). The posting intensity in Arizona for this type of job was noted as being 11:1 (out of every 11 postings there is one posting for this type of job). This was noted as “higher than the posting intensity for all other occupations and companies in the region, indicating that they may be trying harder to hire for this position.” (Lightcast, Q1 2024)

Food Industry Professionals who are part of the Cactus Section Institute of Food Technologists completed an interest survey in March/April 2024. The results (n=34) showed a significant interest in the University of Arizona offering a Food Science curriculum. These results show that the interest in a Food Science Minor is high. I

Most of the Land Grant Universities across the country provide a Food Science curriculum. Examples include Ohio State University, the University of Illinois, Rutgers University, Cornell University, Oregon State University, and the University of Minnesota. Arizona is an exception to this. There is currently no Food Science Curriculum at any level provided by the ABOR University system. NIFA's 1890 land-grant institutions programs are intended to "strengthen research, extension and teaching in the food and agricultural sciences." (NIFA n.d.). The food industry in the state of Arizona is a \$23.3 billion industry, employing 162,000 workers (Killian, 2018). Providing students with the tools they need to succeed in this strong and growing field supports job development in the state.

Similar Programs Offered at Arizona Public Universities:

None

New Resources Required? (i.e., faculty and administrative positions; infrastructure, etc.):

The NSW Foods Lab, Fermentation Lab and Analytical Fermentation Lab are adequate facilities with adequate equipment to support this minor. We will use existing NSW faculty and support staff to support this Minor.

Plan to Request Program/College Fee? YES NO

Estimated Amount: n/a

Fee Justification:

n/a

Specialized Accreditation? YES NO

Accreditor:

n/a

Executive Director Signature: _____

Date: _____