

## New Academic Program Workflow Form

### General

**Proposed Name: Food Safety**

Transaction Nbr: 00000000000155

Plan Type: Specialization

Academic Career: Undergraduate

Degree Offered: Undergraduate Certificate

Do you want to offer a minor? N

Anticipated 1st Admission Term: Fall 2023

### Details

Department(s):

#### AGSC

DEPTMNT ID	DEPARTMENT NAME	HOST
0150	School of Animal & Comparative Biomedical Sciences	Y

Campus(es):

#### DIST

LOCATION	DESCRIPTION
YUMA	Yuma

#### MAIN

LOCATION	DESCRIPTION
TUCSON	Tucson

#### ONLN

LOCATION	DESCRIPTION
ONLN	Online
TUCSON	Tucson

**Admission application terms for this plan:** Spring: Y Summer: Y Fall: Y

**Plan admission types:**

Freshman: Y Transfer: Y Readmit: Y Graduate: Y

Non Degree Certificate (UCRT only): N

Other (For Community Campus specifics): N

**Plan Taxonomy:** 01.1099, Food Science and Technology, Other.

Program Length Type: Program Length Value: 0.00

Report as NSC Program:

SULA Special Program:

**Print Option:**

Diploma: Y Food Safety Certificate

Transcript: Y Food Safety Certificate

**Conditions for Admission/Declaration for this Major:**

-Complete all pre-requisite coursework, as needed:

--> MIC 205A General Microbiology pre-requisites: MCB 181R, 3 units, Introductory Biology I; CHEM 151, 4 units, General Chemistry I

--> MIC 285R Principles of Microbiology pre-requisites: MCB 181R, 3 units, Introductory Biology I, MCB 181L, 1 unit, Introductory Biology Laboratory I; ECOL 182R, 3 units, Introductory Biology II, ECOL 182L, 1 unit, Introductory Biology II Lab, CHEM 152, 4 units, General Chemistry II

-->MIC 204 Microbes and Society pre-requisites: Two courses from Tier One, Natural Sciences (Catalog number 170A, 170B, 170C)

**Requirements for Accreditation:**

n/a

## **Program Comparisons**

### **University Appropriateness**

The Food Safety Undergraduate Certificate will train our students for the rigors of the 21st century workforce, meeting our institutional strategic goals: (1) UArizona Pillar 1: The Wildcat Journey (UAHS 1.1B Train Students for Arizona Communities) by incorporating technical skills and training into classes identified by Arizona industries, local and state government officials, and stakeholders; (2) College of Agriculture & Life Sciences (CALs) Strategic Pillar 2: Produce employable graduates, who can do jobs that do not yet exist and create new jobs by creating an industry, government, and stakeholder taskforce to identify innovative coursework we can develop to prepare students for 21st century jobs;

and (3) School of Animal & Comparative Biomedical Sciences (ACBS) Strategic Goal 1: Prepare undergraduate students for impactful careers in human and animal health and welfare through the development of a relevant curriculum, experiential learning opportunities, and comprehensive faculty mentoring by continually revising curriculum to incorporate the latest trends in skills and training for workforce readiness, creating more 100% Engagement experiential learning opportunities, and empowering students to reach their academic and career goals through mentoring. The professional network of Food Safety professionals through experiential learning and mentoring will provide extracurricular opportunities for Food Safety Certificate students. The Food Safety Certificate supports the Land Grant Mission by ensuring that students are trained to support Arizona Agriculture and stakeholders throughout the State.

### Arizona University System

NBR	PROGRAM	DEGREE	#STDNTS	LOCATION	ACCRDT
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### Peer Comparison

## Faculty & Resources

### Faculty

Current Faculty:

INSTR ID	NAME	DEPT	RANK	DEGREE	FCLTY/%
00665556	Gerardo Lopez	0150	Assit. Prof	Doctor of Philosophy	10.00
00877946	Margarethe Cooper	0150	Assoc. Prof. Pract.	Doctor of Philosophy	25.00
13504337	Kerry Cooper	0150	Assit. Prof	Doctor of Philosophy	25.00
16203602	Sadhana Ravishankar	0150	Professor	Doctor of Philosophy	25.00
16206670	Samuel Garcia	0150	Assoc. Prof. Pract.	Doctor of Philosophy	25.00
22050956	John Wilbur	0150	Assoc. Prof. Pract.	Doctor of Philosophy	25.00
22089509	Margie Sanchez-vega	0150	Assit. Prof. Pract.	Doctor of Philosophy	25.00

Additional Faculty:

N/A, all courses needed are currently available

Current Student & Faculty FTE

DEPARTMENT	UGRD HEAD COUNT	GRAD HEAD COUNT	FACULTY FTE
0150	759	19	33.00

## Projected Student & Faculty FTE

	UGRD HEAD COUNT			GRAD HEAD COUNT			FACULTY FTE		
DEPT	YR 1	YR 2	YR 3	YR 1	YR 2	YR 3	YR 1	YR 2	YR 3
0150	759	780	780	19	19	19	33.00	33.00	33.00

### Library

Acquisitions Needed:

n/a

### Physical Facilities & Equipment

Existing Physical Facilities:

Existing physical facilities that are currently used for classes include centrally used classrooms for lectures, Koffler prep room and laboratories (Koffler rooms 108 and 110)

Additional Facilities Required & Anticipated:

n/a

### Other Support

Other Support Currently Available:

The department's Food Safety Minor advisor will also advise the Food Safety Certificate students

Other Support Needed over the Next Three Years:

n/a

### Comments During Approval Process

12/1/2022 1:52 PM

COOPERMA

Comments
All courses are in the School of Animal and Comparative Biomedical Sciences

## I. CERTIFICATE DESCRIPTION

To best protect our food supply, Food Safety experts are needed wherever our food is grown, processed, stored, or sold. Past and current food safety outbreaks highlight the need for professionals at every level in the food chain along the farm-to-fork continuum to help create, contribute to, and maintain a culture of food safety in their organization. The courses in the Food Safety Certificate will equip students and professionals with the knowledge, expertise, and critical thinking abilities to help keep our food supply safe at every level.

## II. NEED FOR THE CERTIFICATE/JUSTIFICATION

The Food Safety Certificate will provide a powerful credential that has been asked for by Food Safety industry professionals. The Victor P. Smith Food Safety Education Endowment was created to foster educational opportunities as a direct response to the national outbreak of *Escherichia coli* O157:H7 in produce in Yuma, AZ. The knowledge imparted through the Food Safety certificate will be made widely available to Food Safety students and professionals across the country, helping fulfill the intent of the Endowment, which is to make our food supply safer and help prevent future outbreaks.

The Food Safety Certificate provides a meaningful credential that can be obtained by three different sets of learners, based on where and who they are. The Food Safety Certificate will be offered on Main Campus, UArizona-Yuma Distance campus, (and other Distance campuses to be identified), and Arizona Online. Each offering will benefit different learners: Main Campus for traditional students to add an in-demand skill to their resumes as they enter the workforce; UArizona-Yuma Distance campus for students in Agriculture-related majors with produce industry jobs and internship opportunities in the “Winter Lettuce Capital” of the U.S., Yuma, AZ; Arizona Online campus for non-degree-seeking food industry professionals across the country who may use the Certificate to pursue the next level in their career.

The U.S. Bureau of Labor Statistics (U.S. Department of Labor, *Occupational Outlook Handbook*, Agricultural and Food Scientists <https://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm>, visited March 12, 2022) indicates the job outlook for 2020-2030 for individuals with a Bachelor’s degree in the areas of agricultural and food science is estimated to grow by 9%. This growth in the 10-year job outlook is faster than average with 2020 median pay estimated at \$68,830.

Burning Glass reports in 2021 on the employment potential for students with a Bachelor’s degree for Food Science and Technology, Other (CIP 01.1099) and Food Science (CIP 01.1001) indicate that the number of jobs in these areas are projected to grow for our graduates in our region. In the state of Arizona, the average salary for graduates in this area is projected to be \$50,187, compared to the average living wage of \$32,531.

From the prospective student angle, search data research performed in January 2022 by Executive Director, Branding and Marketing Jennifer Yamnitz indicates that the keyword search for food safety certificate generated a high search volume, at a volume of 6,600 per month.

### III. PROGRAM AFFILIATION.

UArizona offers a Food Safety undergraduate minor through UArizona Main and UArizona-Yuma Distance campuses. Our faculty are finalizing the full suite of required coursework for the Food Safety Certificate for Arizona Online and Distance learners through the assistance of professional Instructional Designers in the College of Agriculture and Life Sciences and the Office of Digital Learning.

### IV. CERTIFICATE REQUIREMENTS

#### UNDERGRADUATE CERTIFICATE

Minimum total units required	13
Minimum upper division units	10
Total transfer units that may apply to the certificate. <i>Note: A minimum of six (6) units used to complete the certificate must be University credit.</i>	6
Pre-admissions expectations (i.e., academic training to be completed prior to admission)	<p>-Complete the pre-requisite coursework for <b>one</b> of the following courses:</p> <ul style="list-style-type: none"> <li>• <b>Prerequisites for MIC 205A</b> General Microbiology: MCB 181R, 3 units, Introductory Biology I; CHEM 151, 4 units, General Chemistry I, <b>OR</b></li> <li>• <b>Prerequisites for MIC 285R</b> Principles of Microbiology: MCB 181R, 3 units, Introductory Biology I, MCB 181L, 1 unit, Introductory Biology Laboratory I; ECOL 182R, 3 units, Introductory Biology II, ECOL 182L, 1 unit, Introductory Biology II Lab, CHEM 152, 4 units, General Chemistry II, <b>OR</b></li> <li>• <b>Prerequisites for MIC 204</b> Microbes and Society: Two courses from Tier One, Natural Sciences (Catalog number 170A, 170B, 170C)</li> </ul>
Certificate requirements. List all certificate requirements including core and electives. Courses listed must include <b>course prefix, number, units, and title. Mark new coursework (New)</b> . Include any limits/restrictions needed. Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department.	<p><b>Required Food Safety Certificate coursework:</b></p> <p><b>Complete the following core courses (10 units):</b></p> <ul style="list-style-type: none"> <li>• <b>Complete <u>one</u> of the following:</b> <ul style="list-style-type: none"> <li>○ MIC 205A, 3 units, General Microbiology, <b>OR</b></li> <li>○ MIC 285R, 4 units, Principles of Microbiology, <b>OR</b></li> <li>○ MIC 204, 3 units, Microbes &amp; Society</li> </ul> </li> <li>• <b>Complete <u>all</u> of the following:</b> <ul style="list-style-type: none"> <li>○ ACBS 380R, 3 units, Food Safety &amp; Microbiology</li> <li>○ ACBS 437, 3 units, Food Safety Laws &amp; Legal Policies</li> <li>○ ACBS 494, 1-3 units, Practicum in Food Safety, OR other options include ACBS 399/499 Independent Study,</li> </ul> </li> </ul>

	<p>ACBS 492 Directed Research, ACBS 493 Internship, or ACBS 491 Preceptorship</p> <p><b>Food Safety Certificate Electives:</b>  <b>Complete 3 units from the following:</b></p> <ul style="list-style-type: none"> <li>● ACBS 320, 3 units, Principles of Dairy Produce Processing &amp; Safety</li> <li>● ACBS 355, 3 units, Introduction to Food Processing &amp; Food Safety Preventive Controls</li> <li>● ACBS 377, 3 units, Food Toxicology</li> <li>● ACBS 420, 3 units, Meat Animal Composition</li> <li>● MIC 430, 3 units, Food Microbiology &amp; Biotechnology</li> <li>● ACBS 471, 3 units, Risk Assessment, Management, &amp; Communication</li> </ul>
Internship, practicum, applied course requirements (Yes/No). If yes, provide description.	Yes. Students complete 1-3 units of practicum, which may consist of an internship, independent study or preceptorship in the field that includes mentoring for career preparation and recommendations for professional certification
Any double-dipping restrictions (Yes/No)? If yes, provide description.  *A maximum of 6 units may double-dip with a degree requirement (major, minor, General Education) or second certificate.	The Food Safety Certificate requires 13 units, students may double-dip, 6 units in certificate can overlap with major/minor.
Additional requirements (provide description)	Students must complete a written and oral report as part of practicum/internship evaluated by the certificate committee members.

#### V. CURRENT COURSES

Course prefix and number (include cross-listings)	Units	Title	Pre-requisites	Modes of Delivery (online, in-person, hybrid)	Campus and Location Offered	Dept signed party to proposal? (Yes/No)
MIC 205A	3	General Microbiology	MCB 181R or PSIO 201; CHEM 101B or CHEM 103A	Online, in-person	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class

MIC 204	3	Microbes and Society	Two courses from Tier One, Natural Sciences (Catalog numbers 170A, 170B, 170C)	Online	UArizona-Tucson	n/a ACBS class
MIC 285R, ACBS 285R, ENVS 285R, MCB 285R, PLP 285R, SWES 285R, VSC 285R	4	Principles of Microbiology	MCB 181R, MCB 181L, ECOL 182R, ECOL 182L, CHEM 103A, CHEM 103B, CHEM 104A, CHEM 104B. Concurrent registration, MIC 285R for MIC and V SC majors. Strongly recommended MIC 285L, MIC 285R be taken together by all others.	In-person	UArizona-Tucson	n/a ACBS class
ACBS 380R, NSC 380R	3	Food Safety and Microbiology	MIC 205A or (MIC 285R and MIC 285L), MIC 204 (approval as prerequisite in process)	Online	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class
ACBS 437	3	Food Safety Law and Legal Practices		Online	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class
ACBS 494	1-3	Practicum		Online, in-person	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class
ACBS 320	3	Principles of Dairy Produce Processing and Safety		Online	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class
ACBS 355	3	Introduction to Food Processing & Food Safety Preventive Controls	CHEM 152	Online	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class
ACBS 377, NSC 377	3	Food Toxicology	MIC 205A or (MIC 285R and MIC 285L), MIC 204 (approval as prerequisite in process)	Online	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class



ACBS 420	3	Meat Animal Composition	ANS 102R, ANS 102L, and ANS 210	In-person	UArizona-Tucson	n/a ACBS class
MIC 430	3	Food Microbiology & Biotechnology	ANS 380	Online, in-person	UArizona-Tucson, UArizona-Yuma	n/a ACBS class
ACBS 471	3	Risk Assessment, Management, & Communication		Online, in-person	UArizona-Tucson, UArizona-Yuma, AZ Online	n/a ACBS class
ACBS 491	1-3	Preceptorship		Online, in-person	UArizona-Tucson, UArizona-Yuma	n/a ACBS class
ACBS 492	1-3	Directed Research		Online, in-person	UArizona-Tucson, UArizona-Yuma	n/a ACBS class
ACBS 493	1-3	Internship		Online, in-person	UArizona-Tucson, UArizona-Yuma	n/a ACBS class
ACBS 399/499	1-3	Independent Study		Online, in-person	UArizona-Tucson, UArizona-Yuma	n/a ACBS class

## VI. Learning Outcomes

<p><b>Learning Outcome #1:</b> Students will critically analyze a foodborne pathogen to assess the risk of its causing foodborne illness in a particular food item.</p>
<p><b>Concepts:</b> Students will apply the concepts of epidemiology, pathogenicity, and characteristics of a foodborne pathogen to assess the risk of foodborne illness in an example of a food item.</p>
<p><b>Competencies:</b> Students will be evaluated on a write-up where they will be evaluated on their skills of using and referencing peer-reviewed sources to identify likely microbial risk based on epidemiology, pathogenicity, and characteristics of food. Their skill at describing the risk the foodborne pathogen poses based on the composition of the food will be assessed. Students must score 70% or higher as evaluated by a rubric.</p>
<p><b>Learning Outcome #2:</b> Students will develop a written plan to reduce the risk of foodborne illness given a food item and its intended use.</p>
<p><b>Concepts:</b> Students will apply the concepts of interventions and controls to mitigate risk if a foodborne pathogen given an example of a food item and its intended use by the consumer.</p>
<p><b>Competencies:</b> Students will be evaluated on a write-up where they use peer-reviewed sources and examples to demonstrate their skills to identify and mitigate risks given an example of a food commodity. Their skill at describing the threat to food safety and the description of how the risk will mitigated using an example of an intervention/control will be assessed. Students must score 70% or higher as evaluated by a rubric.</p>
<p><b>Learning Outcome #3:</b> Students will effectively orally communicate the risk of a foodborne illness and outline mitigation strategies for a particular food item.</p>

**Concepts:** Students will effectively orally communicate the epidemiology, pathogenicity and characteristics of a food item and outline interventions and controls to mitigate the risk of a particular foodborne pathogen.

**Competencies:** Students will demonstrate effective oral communication of the epidemiology, pathogenicity and characteristics of a food item and outline interventions and controls to mitigate the risk. Students must score 70% or higher as evaluated by a rubric.

## VII. CONTACTS AND ADMINISTRATION

### UNDERGRADUATE

- a. List the name and contact information for the primary point of contact for the certificate:  
Margarethe Cooper, [cooperma@arizona.edu](mailto:cooperma@arizona.edu), 520-621-3290
- b. List the name and contact information for the person or persons who will serve in the role of Director of Undergraduate Studies (DUS) for the certificate (this is not always the same as the DUS for affiliated programs or head of the managing academic unit.): Margarethe Cooper, [cooperma@arizona.edu](mailto:cooperma@arizona.edu), 520-621-3290
- c. If known, list the members of the certificate oversight committee for this certificate. Note: undergraduate certificate oversight committees shall consist of a minimum of 3 members, 2 of which are faculty and at least one of the 2 is participating faculty in the certificate program. The oversight committee is responsible for 1) qualifications of participating faculty, 2) coordination of admissions recommendations with the Office of Admissions, and 3) curricular changes: (members Food Safety Curriculum Committee): Margarethe Cooper, Dari Trujillo, Sadhana Ravishankar, Gerardo Lopez, Margie Sánchez-Vega, Kerry Cooper, and any future members

## VIII. REQUIRED SIGNATURES

Program Director/Main Proposer (print name and title): Margarethe Cooper, Associate Professor of Practice, Victor P. Smith Endowed Chair in Food Safety Education

Program Director/Main Proposer signature:

Date: 9/2/2022

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Department Head (print name and title): H. Dieter Steklis, Director Interim and Professor, School of Animal and Comparative Biomedical Sciences

Department Head's signature:

Date: 9/2/2022



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Associate/Assistant Dean (print name):

James E. Hunt

Associate/Assistant Dean's signature:

Date: 12/19/2022



Dean (print name):

Dean's signature:

Date:

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For use by Curricular Affairs (Undergraduate):

Committee	Approval date
APS	
Undergraduate Council	
Undergraduate College Academic Administrators Council	

**Learning Outcome 1** Students will critically analyze a foodborne pathogen to assess the risk of its causing foodborne illness in a particular food item.

**Rubric for Assessment:**

<p><b>To meet expectations, in this rubric, 1 point is granted for completion of each criterion, partial credit of 0.5 points may be awarded for each criterion</b></p> <p><b>Student:</b></p>	<p><b>Meets Expectations</b></p>	<p><b>Does Not Meet Expectations</b></p>
Introduces foodborne pathogen and describes the epidemiology	1	0
Describes the pathogenicity of the foodborne pathogen	1	0
Describes the characteristics of the foodborne pathogen	1	0
Analyzes the food item for risk based on composition of food	1	0
Assesses the risk of foodborne illness by the pathogen in the food item	1	0
Uses peer-reviewed sources and examples	1	0

	<p><b>Meets Expectations</b></p>	<p><b>Does Not Meet Expectations</b></p>
<p><b>Score</b></p>	<p>4.2-6 points</p>	<p>4.19 or fewer points</p>

**Learning Outcome 2** Students will develop a written plan to reduce the risk of foodborne illness given a food item and its intended use.

**Rubric for Assessment:**

<p><b>To meet expectations, in this rubric, 1 point is granted for completion of each criterion, partial credit of 0.5 points may be awarded for each criterion</b></p> <p><b>Student:</b></p>	<p><b>Meets Expectations</b></p>	<p><b>Does Not Meet Expectations</b></p>
<p>Introduces the risk of foodborne illness in a food item based on its characteristics</p>	<p>1</p>	<p>0</p>
<p>Describes the intended use by the consumer (e.g. needs to be cooked to a certain temperature or is ready-to-eat)</p>	<p>1</p>	<p>0</p>
<p>Describes interventions and controls</p>	<p>1</p>	<p>0</p>
<p>Analyzes how the interventions and controls mitigate (reduce) risk</p>	<p>1</p>	<p>0</p>
<p>Uses peer-reviewed sources and examples</p>	<p>1</p>	<p>0</p>

	<p><b>Meets Expectations</b></p>	<p><b>Does Not Meet Expectations</b></p>
<p><b>Score</b></p>	<p>3.5-5 points</p>	<p>3.49 or fewer points</p>

**Learning Outcome 3** Students will effectively orally communicate the risk of a foodborne illness and outline mitigation strategies for a particular food item.

**Rubric for Assessment:**

<p><b>To meet expectations, in this rubric, 1 point is granted for completion of each criterion, partial credit of 0.5 points may be awarded for each criterion</b></p> <p><b>Student through a power point oral presentation briefly:</b></p>	<p><b>Meets Expectations</b></p>	<p><b>Does Not Meet Expectations</b></p>
Introduces foodborne pathogen and describes the epidemiology	1	0
Describes the pathogenicity of the foodborne pathogen	1	0
Describes the characteristics of the foodborne pathogen	1	0
Assesses the risk of foodborne illness by the pathogen in the food item based on the intended use by the consumer (e.g. needs to be cooked to a certain temperature or is ready-to-eat)	1	0
Outlines interventions and control strategies to mitigate risk in the food item	1	0
Provides peer-reviewed sources in writing to instructor	1	0
Presents within the recommended time (10-15 minutes)	1	0

	<p><b>Meets Expectations</b></p>	<p><b>Does Not Meet Expectations</b></p>
<p><b>Score</b></p>	<p>4.9-7 points</p>	<p>4.89 or fewer points</p>



BUDGET PROJECTION FORM

Name of Proposed Program or Unit: Food Safety Certificate (non-degree seeking undergraduate)

Budget Contact Person: Leah Chavez	Projected		
	1st Year 2023 - 2024	2nd Year 2024 - 2025	3rd Year 2025 - 2026

METRICS			
Net increase in annual college enrollment UG	10	15	20
Net increase in college SCH UG	130	195	260
Net increase in annual college enrollment Grad			
Net increase in college SCH Grad			
Number of enrollments being charged a Program Fee			
New Sponsored Activity (MTDC)			
Number of Faculty FTE			

FUNDING SOURCES			
<b>Continuing Sources</b>			
UG AIB Revenue			
Grad AIB Revenue			
Program Fee Revenue (net of revenue sharing)			
F and A AIB Revenues			
Reallocation from existing College funds (attach description)			
Other Items (attach description)	10,000	10,000	10,000
<b>Total Continuing</b>	<b>\$ 10,000</b>	<b>\$ 10,000</b>	<b>\$ 10,000</b>
<b>One-time Sources</b>			
College fund balances			
Institutional Strategic Investment			
Gift Funding			
Other Items (attach description)			
<b>Total One-time</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>TOTAL SOURCES</b>	<b>\$ 10,000</b>	<b>\$ 10,000</b>	<b>\$ 10,000</b>

EXPENDITURE ITEMS			
<b>Continuing Expenditures</b>			
Faculty			
Other Personnel			
Employee Related Expense			
Graduate Assistantships			
Other Graduate Aid			
Operations (materials, supplies, phones, etc.)			
Additional Space Cost			
Other Items (attach description)			
<b>Total Continuing</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>One-time Expenditures</b>			
Construction or Renovation			
Start-up Equipment			
Replace Equipment			
Library Resources			
Other Items (attach description)			
<b>Total One-time</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>TOTAL EXPENDITURES</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Net Projected Fiscal Effect</b>	<b>\$ 10,000</b>	<b>\$ 10,000</b>	<b>\$ 10,000</b>

Funding sources, Other items description

Victor P. Smith Endowed Chair in Food Safety Education

Funds from the endowment will be dedicated for marketing and recruitment to support the launch and contir



uation of the Food Safety Certificate

**Subject:** RE: Learning Outcomes for Food Safety Undergraduate Certificate  
**Date:** Monday, November 7, 2022 at 12:03:52 PM Mountain Standard Time  
**From:** Marchello, Elaine V - (evm) <evm@arizona.edu>  
**To:** Cooper, Margarethe A - (cooperma) <cooperma@arizona.edu>  
**Attachments:** image001.png

Hi Margarethe,

I think this is good to go forward. Your outcomes are clear and measurable, and your rubrics are clearly aligned with the outcomes. Concepts and competencies are reasonable.

Elaine

Elaine Marchello, Ph.D.  
Assistant Director, Assessment  
University of Arizona  
University Center for Assessment, Teaching and Technology  
Integrated Learning Center Bldg 70  
Room 105A  
Tucson, AZ 85721  
(520) 621-1328

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**From:** Cooper, Margarethe A - (cooperma) <cooperma@arizona.edu>  
**Sent:** Friday, November 4, 2022 1:19 PM  
**To:** Marchello, Elaine V - (evm) <evm@arizona.edu>  
**Subject:** Learning Outcomes for Food Safety Undergraduate Certificate

Hi Elaine,

I hope your fall semester is going well. Thank you so much for meeting with me in September to advise on developing effective learning outcomes!

I have revised the Learning Outcomes for the proposed Food Safety Undergraduate Certificate for your consideration. I also included the rubrics for assessing each of the learning outcomes (attached).

### **Learning Outcomes for Food Safety Undergraduate Certificate:**

**Learning Outcome #1:** Students will critically analyze a foodborne pathogen to foodborne illness in a particular food item.

**Concepts:** Students will apply the concepts of epidemiology, pathogenicity foodborne pathogen to assess the risk of foodborne illness in an example

**Competencies:** Students will be evaluated on a write-up where they will be using and referencing peer-reviewed sources to identify likely microbial risk pathogenicity, and characteristics of food. Their skill at describing the risk

based on the composition of the food will be assessed. Students must score by a rubric.

**Learning Outcome #2:** Students will develop a written plan to reduce the risk of a food item and its intended use.

**Concepts:** Students will apply the concepts of interventions and controls to a foodborne pathogen given an example of a food item and its intended use by the consumer.

**Competencies:** Students will be evaluated on a write-up where they use the provided examples to demonstrate their skills to identify and mitigate risks given an example. Their skill at describing the threat to food safety and the description of how to mitigate the risk of a foodborne pathogen given an example of an intervention/control will be assessed. Students must score 70% or higher as evaluated by a rubric.

**Learning Outcome #3:** Students will effectively orally communicate the risk of a food item and outline mitigation strategies for a particular food item.

**Concepts:** Students will effectively orally communicate the epidemiology, characteristics of a food item and outline interventions and controls to mitigate the risk of a foodborne pathogen.

**Competencies:** Students will demonstrate effective oral communication of the risk of a food item and outline interventions and controls to mitigate the risk of a foodborne pathogen. Students must score 70% or higher as evaluated by a rubric.

Thank you in advance for your time looking at these proposed learning outcomes. I appreciate your advice and recommendations moving forward!

All the best,  
Margarethe



**Margarethe A. Cooper, Ph.D.**

*Associate Professor of Practice*  
*Victor P. Smith Endowed Chair in Food Safety Education*  
School of Animal & Comparative Biomedical Sciences  
College of Agriculture & Life Sciences

THE UNIVERSITY OF ARIZONA  
Shantz, 233 | Tucson, AZ 85721  
Office: 520-621-3290 | Fax: 520-621-6366  
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[cooper.faculty.arizona.edu/](https://cooper.faculty.arizona.edu/) | *en Español:* [cooper.faculty.arizona.edu/es/2](https://cooper.faculty.arizona.edu/es/2)

*We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.*