THE UNIVERSITY OF ARIZONA

New Academic Program Workflow Form

General

Proposed Name: Safety

Transaction Nbr: 00000000000126

Plan Type: Specialization

Academic Career: Undergraduate

Degree Offered: Undergraduate Certificate

Do you want to offer a minor? N

Anticipated 1st Admission Term: Fall 2022

Details

Department(s):

PBLH

DEPTMNT ID	DEPARTMENT NAME	HOST
4206	Community, Environment & Pol	Y

Campus(es):

MAIN

LOCATION	DESCRIPTION
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: 15.0701, Occupational Safety and Health Technology/Technician.

Program Length Type: Program Length Value: 0.00

Report as NSC Program:

SULA Special Program:

Print Option:

Diploma: Y Undergraduate Certificate, Safety

Transcript: Y Undergraduate Certificate, Safety

Conditions for Admission/Declaration for this Major:

Students are required to have a High School Diploma or equivalent and a 2.0 gpa. Prior to declaration, they must have completed MATH 112 or equivalent and one semester of Chemistry with lab (CHEM 141+145 or CHEM 151 or CHEM 141+143 or CHEM 130+130L or equivalents).

Requirements for Accreditation:

There are no additional requirements, other than the university requirement.

Program Comparisons

University Appropriateness

The proposed program supports the University of Arizona's ambitions for addressing grand challenges in the areas of disease prevention and treatment. The creation of an occupational safety program which includes additional trainings focused on occupational health and safety topics is aligned with the MEZCOPH mission to develop workforce training by integrating our faculty's research and instruction expertise, and to the 2019 Council on Education for Public Health (CEPH) accreditation criteria associated with locating, using, evaluating, and synthesizing information in the contexts in which public health professionals work. Students completing this certificate will be equipped with skills to promote positive safety culture in any organization.

Arizona University System

NBR	PROGRAM	DEGREE	#STDNTS	LOCATION	ACCRDT
1	Specialist Safety & Health Cer	CERTG	10	Arizona State University, Main	Y

Peer Comparison

Please see attached comparison chart.

Faculty & Resources

Faculty

Current Faculty:

INSTR ID	NAME	DEPT	RANK	DEGREE	FCLTY/%
01648962	Eric Lutz	2802	Adj. Lect.	Doctor of Philosophy	10.00
02134265	Aminata Kilungo	4206	Assit. Prof. Pract.	Doctor of Philosophy	10.00
04507521	Robin Polt	2536	Professor	Doctor of Philosophy	10.00
11000631	Deirdre Belle-Oudry	2536	Professor	Doctor of Philosophy	10.00
22060697	Marc Verhougstraete	4206	Assit. Prof	Doctor of Philosophy	5.00

Additional Faculty:

None

Current Student & Faculty FTE

DEPARTMENT	UGRD HEAD COUNT	GRAD HEAD COUNT	FACULTY FTE
4206	0	60	17.00

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
4206	6	11	25	60	65	70	17.00	17.00	17.00

Library

Acquisitions Needed:

None

Physical Facilities & Equipment

Existing Physical Facilities:

Existing physical facilities and equipment are adequate for this program.

Additional Facilities Required & Anticipated:

None

Other Support

Other Support Currently Available:

The MEZCOPH Office of Student Services and Alumni Affairs offers academic advising for all undergraduate degrees in our college. In addition, teaching assistants are assigned to courses with large

enrollments.

Other Support Needed over the Next Three Years:

No additional support staff or assistance will be needed for the next three years.

Comments During Approval Process

THE UNIVERSITY OF ARIZONA

UNDERGRADUATE CERTIFICATE – ADDITIONAL INFORMATION FORM

Note: Certificate programs offered at the University of Arizona, at the undergraduate or graduate level, are not approved as eligible programs for federal student financial aid. Although students enrolled in certificate programs are not eligible for any federal student aid programs, students may be eligible for private loans, outside scholarships, and University of Arizona department funding. For more information, please see Federal Student Financial Aid Eligibility for Programs.

I. CERTIFICATE DESCRIPTION-

Safety professionals often specialize in different areas, such as ergonomics, industrial hygiene, training, occupational psychology and occupational health, or in allied professions such as nursing, fire protection engineering or physiotherapy. Others may be more involved in environmental management, and emergency management. Safety professionals advise, develop strategies, and lead workforce safety and mangement by helping employers establish risk controls to ensure workers safety. The **Undergraduate Safety Certificate** focuses on occupational health and provides educational training in safety topics relevant to a student's chosen career field. Safety is of paramount importance in every workplace. Certain occupations involve risks and hazards beyond the usual everyday experience. Many industries employ safety officers to ensure that essential safety responsibilities of the organization are fulfilled. Individuals with specialized skills and education in safety matters related to these higher-risk workplaces perform critical functions such as developing and enforcing safety rules and protocols, training and educating employees to safely perform their jobs, ensuring compliance with pertinent laws and regulations, performing risk assessment, and promoting positive safety culture in the organization.

II. PURPOSE- discuss the primary intent of this certificate and describe what makes this program distinct from other existing programs on campus.

The Undergraduate Safety Certificate is intended to provide a solid grounding in safety fundamentals applicable to a wide range of career paths, followed by more specialized safety training tailored to the field of interest of the student. This certificate is distinct from other programs in that it is designed for students from a wide range of majors. The list of elective courses spans four different

colleges (Public Health, Science, Engineering, and Mining). The Undergraduate Certificate is intended to: 1) enhance the education of undergraduate students and professional students beyond their regular course of study; 2) provide additional training to professions already in the field including researchers and Public Health practitioners. In addition, the undergraduate certificate also serves as a feeder program into our Public Health programs, including Environmental and Occupational Health.

III. PROGRAM AFFILIATION – specify whether the UA offers an affiliated undergraduate program – the affiliated program may or may not have the same name as the proposed certificate.

This program will be affiliated with the College of Public Health, which offers a BS in Public Health with an emphasis and minor in Occupational Health. Although most of the core coursework will be in the Environmental Health and Science Program in that college, the Certificate will be open for students from any major who wish to advance their understanding in safety topics applicable to their field of study and career goals.

IV. CERTIFICATE DEMAND– *is there sufficient student demand for the certificate?*

a. What is the anticipated student enrollment for this certificate by the third year the certificate is offered? Please provide measurable indicators of student interest in the certificate (survey results of current students or alumni) and with reference to similar programs elsewhere. Provide market analysis or other tangible evidence to support projected enrollment numbers. Curricular Affairs can provie a job posting/demand report by skills obtained/outcomes of the proposed certificate. Please contact Office of Curricular Affairs to request the report(s) for your proposal.

5-YEAR PROJECTED ANNUAL ENROLLMENT					
	1st Year	2nd Year	3rd Year	4th Year	5th Year
Number of Students	6	11	25	25	25

Data/evidence used to determine projected enrollment numbers:

We currently have one Undergraduate Certificate program that started Fall 2021. We do not have enough data to estimate number of student who may enroll in an undergraduate certificate. The estimate is based on our current Graduate Certificate program. Anticipated student enrollment for the first year is 6 students, and increase to 11 and 25 second and third year respectively. However, it is possible that we will have more students given the growing interest in public health and safety.

b. What community needs, preparation for professional certification exams, degree program recruitment, or employability enhancements will this certificate provide? Please provide evidence of feedback from potential employers regarding the value of the proposed program.

There is a high demand for training in Environmental and Occupational Safety. In general, the field of Environmental Health, including occupational health and safety is one of the largest workforce segment in the US. However, the workforce training has not kept up the current need[1]. The undergraduate certificate will allow students to 1) take 12 credits and have a professional certificate, making them competitive in the job market such as in mining and; 2) use the credits towards a BS degree by transferring credits; 3) qualify for other additional professional certificates. For instance, students who complete the CHEM 405a, 405b, and 405c sequence as part of their certificate coursework will be equipped for the Chemical Hygiene Officer certification exam.This Certificate will prepare students for a variety of careers—safety manager, specialist, technician, consultant, trainer, (https://www.oshatrain.org/pdf/career_paths_safety.pdf) to name a few. Occupational Health and Safety Specialists are employed in many job sectors. For example, nearly 22,000 are employed in the US manufacturing sector, and nearly 20,000 are employed in government. [2] In Arizona alone, over 38,000 jobs are connected to the mining sector[3] in safety.

[1] Brooks et al., 2019: Environmental Health Practice Challenges and Research Needs for U.S. Health Departments
[2] US Bureau of Labor Statistics, https://data.bls.gov/oes/#/indOcc/Multiple%20occupations%20for%20one%20industry (visited 10/27/21)
[3] Arizona Mining Association: Economic Impact: https://www.azmining.com/economic-impact/

c. Will there be any collaboration with other departments or universities to maximize resources? If there is collaboration, please include a memo of support from the applicable parties.
The certificate is a joint effort involving the following departments/units: Environmental Health & Safety, Chemistry & Biochemistry, Research Laboratory & Safety Services (RLSS), Mining Engineering, Chemical Engineering, Civil Engineering, Environmental Science, Nutritional Sciences, Animal and Comparative Biomedical Science, and Hydrology and Water Resources.

V. TARGET AUDIENCE(S)- describe the target audience(s) for this certificate and the specific audience needs this certificate aims to address. Address the relevant points below based on your target audience(s).

i. Does this certificate meet the needs of an **industry or workforce partner**? Explain the industry needs this certificate is proposing to address. Provide a list of industry partners with whom you are working and confirmation of this support.

Industry or workforce partners whose needs are met with this program include:

- Public health workforce: local, state public health agencies
- Environmental health
- Food safety and security
- Occupational health professions
- Healthcare professions

ii. Does this certificate provide an **introductory pathway to an existing graduate degree**? Provide the name(s) of the degree(s).

The undergraduate certificate program will prepare students in Environmental and Occupational Health, including those who plan to pursue undergraduate and graduate degrees in these disciplines or other related disciplines. Although this certificate will not feed directly into a chemistry graduate program, expertise in this area will enhance students' employability.

iii. Does this certificate serve as **professional development for the targeted audience**? Explain how this certificate will help the audience develop professionally.

Safety professionals are employed in a variety of work settings including offices, construction, manufacturing,

mines, laboratories, and clinical environments. Since all workplaces must comply with regulations and protect the health and safety of their employees, as well as the public and the environment, the need for expertise in this area is ubiquitous. We recognize that the number of jobs for safety technicians and specialists is limited (119,200 in 2020[4]). However, while it may not be the main focus of a particular career, having expertise in safety qualifies one for special roles within organizations. For example, such a person may provide safety training to other employees or ensure compliance with workplace safety laws.

This certificate is not intended to provide an introductory pathway to an existing graduate degree. However, it should be noted that we plan to develop a Graduate Safety Certificate as well.

The Safety Certificate is designed to provide students specialized training tailored to their specific interest area without requiring completion of an entire degree in environmental health and safety. It will give them an advantage when seeking employment in their field, even if they do not plan to pursue a career in safety. Employers value applicants with this valuable expertise beyond the standard degree coursework. While majors such as Mining Engineering and Chemistry have some safety training built into their program, the Safety Certificate is a formal acknowledgement of advanced safety training and will be an additional credential to distinguish the holder from others with the same degree.

VI. CERTIFICATE REQUIREMENTS - complete the table below to list the certificate requirements, including number of credit hours required and any special requirements for completion. Certificate requirements should include sufficient units to provide a substantive program and an appropriate level of academic rigor and in no case be less than 12 units of credit. ***Note: future changes to the curriculum originally approved for the certificate must be approved by the Undergraduate Council.***

Minimum total units required ***minimum 12 units***	13
Minimum upper-division units required	11

4 https://www.bls.gov/ooh/healthcare/occupational-health-and-safety-specialists-and-technicians.htm (visited *October 05, 2021*).

minimum 6 units of credit must be upper division UA coursework	
Total transfer units that may apply to the certificate.	6
List any special requirements to declare/admission to this certificate (completion of specific coursework, minimum GPA, interview, application, etc.)	**MATH** MATH 112 or equivalent **CHEMISTRY** CHEM 151 or CHEM 141 +143, CHEM 141+145 or CHEM 130 + 130L (or equivalent) 2.0 GPA
Certificate requirements. List all required certificate requirements including core and electives. Courses listed must include course prefix, number, units, and title. Mark new coursework (New). Include any limits/restrictions needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department.	**The certificate requires 13 units** **Core Courses (7 units)** EHS 375: Intro to Environmental and Occupational Health (3 units) EHS 422: Safety Fundamentals (3 units) CHEM 405A: Basic Laboratory Safety (1 unit) **Elective Courses (6 units)** EHS 418 (3) Human Health Risk Assessment EHS 484 (3) Fundamentals of Environmental and Occupational Health CHEM 405B (1) Advanced Laboratory Safety CHEM 405C (1) Chemical Hygiene and Regulations

	MNE 297A (1) Underground Mine Safety MNE 297C (1) Fundamentals of Mine Rescue MNE 423 (3) Historic and Contemporary Role of US Regulatory Agencies (OSHA, MSHA, EPA) MNE 424 (3) Miner Health: Fitness-for-Duty, Mitigating Exposures, and Managing Disease Risk MNE 425 (3) Mine Emergencies and Disasters – Prevention, Response, and Recovery MNE 426 (1) Health & Safety in Mining CE/CHEE 478 (3) Hazardous Waste Management
Internship, practicum, applied course requirements (Yes/No). If yes, provide description.	No
Additional requirements (provide description)	None
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.***	Yes. Students may apply 6 units toward their undergraduate major degree.

VII. CURRENT COURSES.

Course prefix and number	Units	Title	Course Description	Pre-requisites	Modes of delivery (online, in-	Typically Offered	Dept signed party to

(include cross-listings)					person, hybrid)	(F, W, Sp, Su)	proposal? (Yes/No)
EHS 422	3	Safety Fundamentals	Fundamentals of occupational safety, emphasizing regulatory requirements and best-practices targeted to eliminate major sources of occupational injuries. Hazard identification, behavioral safety, and incident investigation will be discussed.	BIOS 376, EHS 375, or equivalent; or consent of instructor	In-person	Sp	Yes
EHS 484 MNE 484 NSC 484 PCOL 484 CE 484 CPH 484 N_SC 484 OSH 484 PHL 484	3	Fundamentals of Environmental and Occupational Health	Introduction to the principles of occupational and environmental health, with emphasis on industrial hygiene aspects of recognition, evaluation, and control of environmental and industrial health hazards.		In-person	F	Yes
EHS 375	3	Introduction to Environmental and Occupational Health	This course introduces students to physical, chemical and biological hazards found in the environment and health risks associated with workplace and community exposure to them. Risks to special populations and mechanisms of reducing or controlling these risks are discussed.	Prerequisite or concurrent registration in EPID/CPH 309.	In-person Online (summer)	F, Sp, Su	Yes
EHS 418 ENVS 418 SWES 418 CPH 418 CPH 418-SA	3	Human Health Risk Assessment	The purpose of this course is to enhance students knowledge and skills related to environmental risk assessment, including hazard assessment, exposure assessment, toxicity assessment, and risk characterization.		In-person	F	Yes
MNE 297A	1	Underground Mine Safety	The objective of this course is to provide students the forty (40) hour Mine Safety and Health Administration's required safety training for new underground miners. The course will be taught in accordance with the MSHA approved training plan for the University of Arizona's San Xavier Mining Laboratory. This course includes training blocks in the statutory rights of miners and their representatives, self-rescuer and respiratorydevices, entering and leaving the mine including sign-in/sign-out and tag-in/tag-out	MNE 205	In-person	F, Sp	Yes

			procedures, transportation, communications, mine maps, escapeways, emergency evacuation, barricading, roof and ground control, ventilation plans, hazard recognition, electrical hazards, mine gases, health and industrial hygiene issues, first aid and other required subjects.				
MNE 297C	1	Fundamentals of Mine Rescue	This course will provide students with an introduction to fundamental knowledge of mine rescue,equipment utilizedby mine rescue teams,and how to safely operate and maintain each piece of equipment.Students will be trained to correctly and safely operate and maintain theDrager BG4 breathing apparatus and taught basic knowledge about how to safely conduct a mine rescue.	MNE 205	In-person	F	Yes
MNE 423	3	Historic and Contemporary Rolf of US Regulatory Agencies (OSHA, MSHA, EPA)	Occupational and environmental federal regulatory agencies affect how we work and influence our environment. This course delves into the history of Occupational Safety and Health Agency (OSHA), and the Mining Safety and Health Agency (MSHA), and Environmental Protection Agency (EPA) and the major events that have resulted in contemporary impacts these organizations, and the respective laws, have on our lives, economics, and businesses.	Advanced standing, MNE 426, or instructor consent	In-person	Sp	Yes
MNE 424	3	Miner Health: Fitness-for-Duty, Mitigating Exposures, and Managing Disease Risk	Mitigating mining-related disease risks requires a spectrum of tools ranging from hazard identification and exposure measurement to control validation and measuring employee fitness-for-duty. From the context of real-life mining scenarios and business cases, the course will cover mining-related diseases, industrial hygiene, and occupational medicine approaches for anticipating, recognizing, evaluating, and controlling mining hazards and measuring miner fitness-for-duty; with the primary focus on recognizing and evaluating hazards and managing risk through controls and regulatory compliance. The course will dive deeply into the cause-effect of miner health and diseases while emphasizing the qualitative and quantitative assessment tools to validate controls and mitigate	Advanced standing, MNE 426, MNE 402, or instructor consent	In-person	F	Yes

			health risks. Techniques will be applied for hazard identification, quantification of risk, and appropriate application of the hierarchy of controls.				
MNE 425	3	Mine Emergencies and Disasters – Prevention, Response, and Recovery	Effective and efficient prevention, response, and recovery from emergencies and disasters is a business necessity for every mine operation. Prevention relies on risk management and safety systems built on risk identification, root cause delineation, measurement, and monitoring which are strengthened and optimized by regular evaluation using exercises. Disaster response that mitigates the severity of the actual emergency requires tools and specialized training that help bring calm during chaos with tangible results (e.g., saved lives, saved environment, saved infrastructure, and saved equipment). The infrastructure needed for effective mine disaster response includes components ranging from incident command, miner self-escape, aided escape, and mine rescue. Following mitigation of the most severe aspects of the emergency, the organization begins the process of recovery that returns the mine to a safer operation than before the event. Recovery considers a spectrum of impacts to personnel (physical and psychological trauma), the environment (contamination), infrastructure (damage to ground control, ventilation, and data systems), and equipment (cost and length of time to replace/repair damaged machinery). This course will dive deeply into the history of major mine disastersand resultant federal regulatory responses, best practices in risk management and safety systems, incident command systems including self-escape and mine rescue, and application of business continuity plans to efficiently and effectively return the mine to a state of safe operation.	Advanced standing, MNE 426, or instructor consent	Hybrid	Sp	Yes

MNE 426 GEN 426	1	Health & Safety in Mining	Fundamental concepts in the recognition, evaluation and control of health and safety hazards encountered in mining operations; includes a review of engineering management responsibilities to control accidents, a review of federal regulations and standards affecting the industrial workplace, and instruction regarding the interaction of industrial hygiene, safety, fire protection and workers' compensation to control losses resulting from industrial accidents.	Adv Stdg: Engineering.	In-person	F	Yes
CHEE 478 CE 478	3	Hazardous Waste Management	Management, planning, legal and engineering aspects of liquid and solid hazardous waste treatment and disposal.	Adv Stdg: Engineering or instructor permission	In-person	Sp	
CHEM 405A	1	Basic Laboratory Safety	This course covers basic laboratory safety topics including chemical and physical hazards, risk assessment, methods of risk minimization, and emergency preparedness. Students will be equipped with essential tools to safely work in laboratory environments.	CHEM 151, 152 (or equivalent)	In-person	Sp	Yes
CHEM 405B	1	Advanced Laboratory Safety	In this course we will examine advanced topics in laboratory safety. We will build on the foundation covered in CHEM 405A/505A by delving deeper into each of the four principles of ***RAMP***: Recognizing hazards, Assessing risk, Minimizing risk and Preparing for emergencies. Topics will include the OSHA laboratory standard, hazard assessment, biological and radiation hazards, toxins, engineering controls, waste handling and regulations, emergency planning and response, and others.	CHEM 405A + CHEM 241A	In-person	Sp	Yes

CHEM 405C	1	Chemical Hygiene and Regulations	In this course we will examine the laws and regulations pertaining to chemical and other laboratory environments and learn how to implement safe chemical hygiene in the workplace. Several government entities (including OSHA, EPA, DEA, and DHS) regulate various aspects of safe chemical use. Employers and safety personnel in workplaces where chemicals are used must be aware of and comply with these safety requirements. We will discuss how to manage a laboratory environment to ensure legal compliance as well as protect employees, community, and the environment. Upon successful completion of this course, students will be equipped to take the Chemical Hygiene Officer certification exam.	CHEM 405B	In-person	Sp	Yes

VIII. NEW COURSES NEEDED –N/A.

Subject description for new prefix (if requested). Include your requested/preferred prefix, if any: None

IX. FACULTY INFORMATION- complete the table below. **NOTE: full proposals are distributed campus-wide, posted on committee agendas and should be considered "publicly visible". Contact Office of Curricular Affairs if you have concerns about CV information being "publicly visible".**

Faculty Member	Involvement	UA Vitae link or "CV attached"
Aminata Kilungo	Certificate development	https://profiles.arizona.edu/person/paminata
Deirdre Belle-Oudry	Teach CHEM 405a/505a; co-teach CHEM 405b/505b, CHEM 405c/505c and development of certificate	https://cbc.arizona.edu/faculty/deirdre-dee-belle-oudry
Robin Polt	Co-teach CHEM 405b/505b, CHEM 405c/505c and development of certificate	https://profiles.arizona.edu/person/polt

Eric Lutz	Teach MNE 423, MNE 424, MNE 425, MNE 426 and development of certificate	https://miningsh.arizona.edu/people/eric-lutz-phd-cmsp-bsc
Rustin Reed	Teach EHS 422	https://miningsh.arizona.edu/people/rustin-reed-phd-cih-csp
Marc Verhougstraete	Teach EHS 375	https://profiles.arizona.edu/person/mverhougstraete

X. **STUDENT LEARNING OUTCOMES AND CURRICULUM MAP** – describe what students should know, understand, and/or be able to do after completing this certificate. Provided a detailed curricular map linking student outcomes to specific courses and class activities. Consider working with Office of Instruction and Assessment to create a curricular map using Taskstream.

Learning Outcomes:

1. **Safety Foundational Knowledge**
   Apply core industrial hygiene and environmental health activities including anticipation, recognition, evaluation, and control of exposures
2. **Occupational Safety Proficiency**
   Evaluate occupational safety information
3. **Chemical Safety Proficiency**
   Implement safe practices with respect to the use, storage, disposal of chemicals
   Identify chemical hazard and safety information

Learning Outcome #1: Recognize potential environmental and occupational risks from environmental hazards and solicit ways to mitigate the risk
Concepts: Toxicology, environmental health and risks paradigm, and work related injuries.
Competencies: Apply core industrial hygiene and environmental health activities including anticipation, recognition, evaluation, and control of exposures
Learning Outcome #2: Evaluate and synthesize occupational safety information
Concepts: Basic safety inspectionstrategies; hazard identification and job hazard analysis

Competencies: Identify agents, factors, and stressors generated by and/or associated with defined sources, unit operations, and/or processes
Learning Outcome #3: Apply chemical knowledge and the RAMP safety principles to make decisions about your and others' safety in the laboratory environment and in your life
Concepts: Hazards, chemical properties, and potential risks of exposure
Competencies: Identify chemical hazard and safety information and implement safe practices in using chemicals
Learning Outcome #4: Demonstrate a working knowledge of the occupational health and safety regulations contained in the Federal Register under the 29 CFR 1910 standards
Concepts: Basic legal, ethical, economic and regulatory dimensions of the different agencies and branches of government
Competencies: Evaluate occupational safety information and legislation

Safety Certificate Curriculum Map (Undergraduate)

	Safety Foundational Knowledge	**Occupational Safety Proficiency**		**Chemical Safety Proficiency**
Course/Activity	Apply core industrial hygiene and environmental health activities including anticipation, recognition, evaluation, and control of exposures	Identify agents, factors, and stressors generated by and/or associated with defined sources, unit operations, and/or processes	Evaluate occupational safety information and legislation	Identify chemical hazard and safety information and implement safe practices in using chemicals
EHS 375	Assessed			
EHS 422		Assessed	Assessed	
CHEM 405A				Assessed
Student surveys	Assessed		Assessed	Assessed

VIII. ASSESSMENT PLAN FOR STUDENT LEARNING– identify factors that indicate that completion of the certificate enhances the undergraduate experience. Describe measures for programmatic assessment, and provide a detailed plan for assessing certificate outcomes.

Program assessment will be measured by the following:

a. **Course embedded assessments** including exams and quizzes, written assignments, presentations and group projects.

b. **Exit survey** that students are asked to complete post completion of all certificate requirements.

c. **Job placement** determined through the student/alumni survey at different intervals.

IX. MARKETING AND RECRUITMENT - provide a detailed and robust marketing strategy for this certificate.

The marketing of the Certificate is part of the broader MEZCOPH strategic plan for program development, marketing and recruitment for students. As part of these efforts, we will work with the University of Arizona Mel and Enid Zuckerman College of Public Health Western Region Public Health Training Center, and our Communication and Digital Media to market the program, and will also explore other partners.

As part of the marketing and recruitment process, we will target a diverse body of students and working professionals. MEZCOPH has a diverse body of faculty and the course will be taught by existing faculty.

X. CONTACTS AND ADMINISTRATION

a. List the name and contact information for the primary point of contact for the certificate.

Aminata Kilungo, PhD
Assistant Professor and Program Director, Environmental Health Sciences
Mel and Enid Zuckerman College of Public Health
Email: paminata@email.arizona.edu

And

Deidre Belle-Oudry, Associate Department Head, Academic Affairs
Department of Chemistry and Biochemisty
Email: dbelle@arizona.edu

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.)

Director of Undergraduate Studies: Melanie Fleck, Coordinator, Public Health Undergraduate Programs
Mel and Enid College of Public Health
Email: mfleck@email.arizona.edu

c. If known, list the members of the certificate oversight committee for this certificate. *Note: undergraduate certificate oversight committees shall considst 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.*

Certificate Oversight Committee Members:

John Ehiri, PhD, Professor and Dean, Academic Affairs
Kelly Reynolds, PhD, Professor and Dept Chair, Environmental Health Sciences
Melanie Fleck, Coordinator, Public Health Undergraduate Programs

THE UNIVERSITY OF ARIZONA

BUDGET PROJECTION FORM

Name of Proposed Program or Unit: Undergraduate Certificate in Safety (Main Campus) offered by the Community Environment and Policy Department in the Mel & Enid Zuckerman College of Public Health

	Projected		
Budget Contact Person: Kelly Reynolds, PhD and John Ehiri, PhD	**1st Year** 2022 - 2023	**2nd Year** 2023 - 2024	**3rd Year** 2024 - 2025
METRICS			
Net increase in annual college enrollment UG	6	11	25
Net increase in college SCH UG	84	154	350
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		0.05	0.20
FUNDING SOURCES			
Continuing Sources			
UG AIB Revenue	13,860	25,410	57,750
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)			
Total Continuing	$ 13,860	$ 25,410	$ 57,750
One-time Sources			
College fund balances			
Institutional Strategic Investment			
Gift Funding			
Other Items (attach description)			
Total One-time	$ -	$ -	$ -
TOTAL SOURCES	$ 13,860	$ 25,410	$ 57,750
EXPENDITURE ITEMS			
Continuing Expenditures			
Faculty	-	6,500	26,000
Other Personnel			
Employee Related Expense	-	2,015	8,060
Graduate Assistantships			
Other Graduate Aid			
Operations (materials, supplies, phones, etc.)			
Additional Space Cost			
Other Items (attach description)			
Total Continuing	$ -	$ 8,515	$ 34,060
One-time Expenditures			
Construction or Renovation			
Start-up Equipment			
Replace Equipment			
Library Resources			
Other Items (attach description)			
Total One-time	$ -	$ -	$ -
TOTAL EXPENDITURES	$ -	$ 8,515	$ 34,060
Net Projected Fiscal Effect	$ 13,860	$ 16,895	$ 23,690

THE UNIVERSITY OF ARIZONA

New Academic Program
PEER COMPARISON

Program name, degree, and institution	Proposed UA Program	Workplace Health and Safety Manager Certificate Program; University of California, Davis	Agricultural Safety & Health Minor; University of Illinois at Urbana-Champaign
Current number of students enrolled	[redacted]		
Program Description	Safety professionals often specialize in different areas, such as ergonomics, industrial hygiene, training, occupational psychology and occupational health, or in allied professions such as nursing, fire protection engineering or physiotherapy. Others may be more involved in environmental management, and emergency management. Safety professionals advise, develop strategies, and lead workforce safety and management by helping employers establish risk controls to ensure workers safety. The proposed Undergraduate Safety Certificate will focus on occupational health and provide educational training in safety topics relevant to a student's chosen career field. Safety is of paramount importance in every	https://cpe.ucdavis.edu/certificate-program/workplace-health-and-safety-manager-certificate-program Gain the expertise you need in today's work environment by expanding your knowledge of current health and safety issues and regulations and learn to create and maintain a safer work environment. You will learn about the most current OSHA regulations and methods of compliance, as well as state-of-the-art emergency management techniques. Discover how to integrate employee health and safety into daily decision making, save organizational resources and contribute to enhanced employee performance. This program benefits safety directors and officers, environmental supervisors, union representatives, health and safety technicians, occupational health	http://catalog.illinois.edu/undergraduate/aces/minors/agricultural-safety-health/ This minor provides an in-depth understanding of the occupational safety and health issues associated with production agriculture. Students gain familiarity with injury and illness rates and control methodologies among agricultural populations. Additionally, students will develop an understanding of how to develop a safety risk management plan for a farm or other agricultural related business.

	workplace. Certain occupations involve risks and hazards beyond the usual everyday experience. Many industries employ safety officers to ensure that essential safety responsibilities of the organization are fulfilled. Individuals with specialized skills and education in safety matters related to these higher-risk work places perform critical functions such as developing and enforcing safety rules and protocols, training and educating employees to safely perform their jobs, ensuring compliance with pertinent laws and regulations, performing risk assessment, and promoting positive safety culture in the organization.	specialists/nurses, risk managers, compliance managers, plant or facilities managers, production supervisors, resource specialists and workers' compensation specialists. You'll learn how to: Examine the critical health and safety issues of private business, industry and government Establish and manage a proactive health and safety program Use regulations as tools to identify and control hazards Investigate causes of accidents when they occur so as to prevent them from happening again	
Target Careers	Healthcare, Engineering, Research Labs, Mining, Construction, Governmental and Non-governmental Organizations	Healthcare, Engineering, Research Labs, Construction, Governmental and Non-governmental Organizations	Agriculture, Healthcare, Research Labs, Governmental and Non-governmental Organizations
Emphases? (Yes/No) List, if applicable	No	No	No
Minimum # of units required	13	15.75	18
Level of Math required (if applicable)	Math 112	N/A	N/A

Level of Second Language required (if applicable)	N/A	N/A	N/A
Pre-Major? (Yes/No) If yes, provide requirements.	No	No	No
Special requirements to declare/gain admission? (i.e. pre-requisites, GPA, application, etc.)	Students are required to have a High School Diploma or equivalent and a 2.0 gpa. Prior to declaration, they must have completed MATH 112 or equivalent and one semester of Chemistry with lab (CHEM 141+145 or CHEM 151 or CHEM 141+143 or CHEM 130+130L or equivalents).	Students are required to have a High School Diploma or equivalent and complete an application form for the certificate.	Students must have completed a minimum of 30 units undergraduate credit (sophomore standing) with a 2.5 gpa to declare the minor.
Internship, practicum, or applied/experiential requirements? If yes, describe.	No	No	No

Additional questions:

1. How does the proposed program align with peer programs? Briefly summarize the similarities between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

   The proposed undergraduate certificate in Safety is similar to its peer programs in several ways. The overall theme of short-term, workforce development in the area of occupational health and safety is present in all three programs. All the programs provide an introduction for identifying and assessing hazards in the workplace and methods for developing safety management programs that prevent injury and illness on the job.

2. How does the proposed program stand out or differ from peer programs? Briefly summarize the differences between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

   The UA College of Public Health has partnered with our colleagues in Science, Engineering and Mining, to develop an undergraduate certificate with a broad focus, intended to provide training to practicing professionals in many fields, including mining safety, researchers and public health practitioners. The peer program at the University of Illinois is geared to enhance a student's undergraduate education as they pursue a bachelor's degree and, while it does include some public health classes, its scope is narrow with a focus specifically on Agricultural Safety. The peer program at the University of California Davis does not include any public health in its curriculum and takes a minimum of 2.5 years to complete, while our certificate can be completed in one year.

3. How do these differences make this program more applicable to the target student population and/or a better fit for the University of Arizona?

   The proposed undergraduate certificate in Safety draws upon the strengths of UA faculty's expertise in environmental and occupational health, laboratory and mining safety. Copper mining is an important industry in Arizona's economy, and the inclusion of multiple mining safety electives positions our program to serve the workforce needs of our state. Overall, the certificate is broad enough to provide students and working professionals the opportunity to advance their educational and career goals in many different fields.

MEMO

DATE: **January 25, 2022**

TO: Kelly Reynolds, Professor and Head, Environmental Health Sciences
Aminata Kilungo, Assistant Professor of Practice and Program Director, Environmental Health Sciences

FROM:

RE: **Use of Chemical and Environmental Engineering course in the Undergraduate Safety Certificate**

We approve the course for use in the undergraduate curriculum for the **safety certificate**, as specified below:

CHEE 478 - Introduction to Hazardous Waste Management (3 units) – Elective

Managing Administrator: Prof. Kimberly L. Ogden, Department Chair

Managing Administrator's Signature: _____ _____ Date: 01/26/2022

THE UNIVERSITY OF ARIZONA
COLLEGE OF ENGINEERING
Mining & Geological Engineering

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http://mge.arizona.edu
http://minerals.arizona.edu

MEMO

DATE: January 25, 2022

TO: Kelly Reynolds, Professor and Head, Environmental Health Sciences
Aminata Kilungo, Assistant Professor of Practice and Program Director, Environmental Health Sciences

FROM: Moe Momayez, Interim Head, Mining and Geological Engineering
moe.momayez@arizona.edu
520-621-6580

RE: Use of mining course (s) in the Undergraduate Safety Certificate

We approve the course(s) for use in the undergraduate curriculum for the safety certificate, as specified below:

MNE 297A (1) Underground Mine Safety

MNE 297C (1) Fundamentals of Mine Rescue

MNE 423 (3) Historic and Contemporary Role of US Regulatory Agencies (OSHA, MSHA, EPA)

MNE 424 (3) Miner Health: Fitness-for-Duty, Mitigating Exposures, and Managing Disease Risk

MNE 425 (3) Mine Emergencies and Disasters – Prevention, Response, and Recovery

MNE 426 (1) Health & Safety in Mining

Please note that due to 'Advanced Standing' requirement, only students in the College of Engineering can enroll in upper division engineering courses (MNE 423, MNE 424, MNE 425 and MNE 426).

Managing Administrator: Moe Momayez

Managing Administrator's Signature: _____ Date: 01/31/2022

MEMO

DATE: **January 25, 2022**

TO: Kelly Reynolds, Professor and Head, Environmental Health Sciences
Aminata Kilungo, Assistant Professor of Practice and Program Director, Environmental Health Sciences

FROM: Deirdre Belle-Oudry, Associate Department Head for Academic Affairs

RE: **Use of Chemistry course (s) in the Undergraduate Safety Certificate**

We approve the course(s) for use in the undergraduate curriculum for the **safety certificate**, as specified below:

CHEM 405A Basic Laboratory Safety (1 unit) – Core course

CHEM 405B Advanced Laboratory Safety (1 unit) – Elective

CHEM 405C Chemical Hygiene and Regulations (1 unit) – Elective

Managing Administrator: Deirdre Belle-Oudry, Associate Department Head for Academic Affairs

Managing Administrator's Signature: _____ __ Date:__1/25/2022_____