

U-CAAC Review of New Program Proposal

This form provides committee-wide feedback on the following proposed program.

Undergraduate

Graduate

College:

Proposal Name:

Proposer's Name and Email:

Reviewers:

1. **Rationale.**

Is the mission of the program well justified?

2. **Academic Standards/Compliance.**

Do the curriculum and student support provisions meet the academic and policy standards of the university?

3. **Overlaps.**

Are there perceived duplications with other UArizona programs? Conversely, could shared interests and emphases lead to collaborative or synergistic programs with other parts of the university? (These could take the form of co-ownership, co-delivered courses, shared faculty, shared facilities, etc.)

4. **Viability.**

Is the program likely to enroll enough students to meet UArizona benchmarks for productive programs? Is there plausible evidence to back up enrollment predictions and budget projections?

5. **Other feedback/comments.**

6. **Approval or Revisions Requested.**

New Academic Program Workflow Form

General

Proposed Name: Future Earth Resilience

Transaction Nbr: 00000000000069

Plan Type: Minor

Academic Career: Undergraduate

Degree Offered:

Do you want to offer a minor? N

Anticipated 1st Admission Term: Fall 2022

Details

Department(s):

HNRS

DEPTMNT ID	DEPARTMENT NAME	HOST
2514	Honors College	Y

Campus(es):

MAIN

LOCATION	DESCRIPTION
TUCSON	Tucson

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

Plan admission types:

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

Non Degree Certificate (UCRT only): N

Other (For Community Campus specifics): N

Plan Taxonomy: 30.3301, Sustainability Studies.

Program Length Type: Program Length Value: 0.00

Report as NSC Program:

SULA Special Program:

Print Option:

Diploma: Y W.A. Franke Honors College Future Earth Resilience Minor

Transcript: Y W.A. Franke Honors College Future Earth Resilience Minor

Conditions for Admission/Declaration for this Major:

Meet with departmental interview committee.

Requirements for Accreditation:

NA.

Program Comparisons

University Appropriateness

Chosen themes for Future Earth Resilience are well-aligned with the University's Strategic Plan Pillars and directly addresses many of the Grand Challenges posed in the Strategic Plan. The Future Earth Resilience minor grounds itself by exploring resilience via establishing an understanding of how we as humans interact with the natural and built environment, and by leveraging valuable research and engagement elements afforded by the UArizona Biosphere 2 science facility. We promote the broadening of student understanding of resilience by incorporating the expertise of the greater UArizona community to further showcase our Institutional Excellence. Since the minor is so interdisciplinary and one of the first of its kind, we expect that this minor will be a huge recruitment and retention opportunity for students within the Honors College to explore the resources and excellence throughout the university and contribute to the overall Wildcat Journey. We are driven to create a diverse, inclusive, equitable, and just learning environment and incorporate these principles in our program design, curriculum, and electives that can satisfy minor requirements. We have developed this program to highlight the value of work by intentionally including courses and foci on non-Western pedagogy and practices, like environmental intersectionality as it relates to Indigenous communities in Arizona in line with goals of the Arizona Advantage pillar.

Further, one of the overarching aims of the University of Arizona's Strategic Plan is to encourage design and implementation of action-driven solutions towards urgent challenges people are facing today. The in-development cumulative capstone course HNRS 4** will aim to address these challenges through an interdisciplinary lens. The course will encourage students to consider their experiences and all that they learned during the minor to answer "Now what?". Here, students will develop actionable ideas and proposals to address

challenges in context with UA goals. They will be asked to describe what and how solutions can be implemented, justify their ideas based on current understanding of the environment and a proposed solution's potential impact, and contextualize these in a socioeconomic and political framework to think about who should be involved and what populations would be served. The approach and themes of this new capstone course and the proposed Future Earth Resilience minor directly addresses these global needs in a way that few other programs are doing. Thereby, the minor will further cement the University of Arizona as a leader of local and global resilience and align with investment and prioritization of the new Arizona Institutes for Resilience in the UA office of Research, Innovation, and Impact.

Arizona University System

NBR	PROGRAM	DEGREE	#STDNTS	LOCATION	ACCRDT
-----	---------	--------	---------	----------	--------

Peer Comparison

This program is different than its peers because of its holistic concern about resilience and its goals to stretch traditional definitions of resilience. Peer 1 primarily focuses on climate change resilience. Peer 2 is more broad, but does not explore how non-environmentally focused sustainability and resilience are achieved. We are incorporating different topics, including environmental sustainability, climate change, public health, economy, social justice, and beyond, as all are needed to achieve equitable resilience. We believe that science and engineering are facets to achieve resilience, but more is needed to implement solutions. We have developed this program to explore how different solutions can help or harm a population. In this program, we explore that not all problems can be solved with an engineering innovation, especially not on its own, as culture, communication, and community play a role. Further, we are emphasizing non-Western ways to explore resilience and the world around us. Neither of these programs do this and very few (if any) explore resilience from these different types of perspectives, while trying to expand our understanding of how we understand the earth, its people, and resilience in these ways.

Faculty & Resources

Faculty

Current Faculty:

INSTR ID	NAME	DEPT	RANK	DEGREE	FCLTY/%
01645366	Joost Van Haren	HNR S	Assoc. Prof. Pract.	Doctor of Philosophy	10.00
07102642	Kevin Bonine	0420	Instructor	Doctor of Philosophy	10.00
12202070	John Pollard	HNR S	Professor	Doctor of Philosophy	10.00
23062851	Caitlyn Hall	HNR	Assit. Prof.	Doctor of	70.00

INSTR ID	NAME	DEPT	RANK	DEGREE	FCLTY/%
		S	Pract.	Philosophy	

Additional Faculty:

NA

Current Student & Faculty FTE

DEPARTMENT	UGRD HEAD COUNT	GRAD HEAD COUNT	FACULTY FTE
2514	0	0	1.00

Projected Student & Faculty FTE

DEPT	UGRD HEAD COUNT			GRAD HEAD COUNT			FACULTY FTE		
	YR 1	YR 2	YR 3	YR 1	YR 2	YR 3	YR 1	YR 2	YR 3
HNR S	15	30	45	0	0	0	1.00	1.50	2.00

Library

Acquisitions Needed:

NA

Physical Facilities & Equipment

Existing Physical Facilities:

Existing physical facilities and equipment are adequate for this program.

Additional Facilities Required & Anticipated:

NA

Other Support

Other Support Currently Available:

NA

Other Support Needed over the Next Three Years:

NA

Comments During Approval Process

NEW ACADEMIC PROGRAM-STANDALONE UNDERGRADUATE MINOR

ADDITIONAL INFORMATION FORM

I. MINOR DESCRIPTION – *provide a marketing/promotional description for the proposed minor. Include the purpose, nature, and highlights of the curriculum, faculty expertise, etc. The description should match departmental and college websites, handouts, promotional materials, etc.*

Earth and humankind's future relies upon sustaining healthy ecosystems, developing innovative interdisciplinary solutions, and centering perspectives of marginalized communities to equitably develop adaptation solutions for the betterment of all of Earth's inhabitants. In this new minor program, we encourage students to go beyond traditional definitions of resilience by combining earth sciences with other disciplines. We look to the United Nations Sustainable Development goals to shape our approach as we explore resilience from different angles including climate change, public health, non-Western practices, ethics and equity, education, economic and resource sovereignty, cultural preservation, human rights, etc. By incorporating diverse perspectives and methods, students will have the opportunity to engage in experiential, design-thinking approaches to develop innovative, sustainable solutions to support our planet's life within the reality of our changing earth.

The minor will have a cohort-generating introductory course featuring experiences at Biosphere 2. This unique one-of-a-kind experience will blend large-scale scientific research and inspirational education to better understand earth processes and their value to nature and society. We are excited to be able to leverage the focal role of Biosphere 2 to introduce students to this minor through hands-on active learning, peer community building, and greater connections to faculty and mentoring opportunities. In this course, students will be asked to pick a topic thread that they will carry with them throughout this program.

Following the introductory course, students will have the opportunity to explore resilience to answer the following guiding questions:



1. *How can we explore the evolution of the relationship between earth processes and people?* Looks to develop a foundational understanding of earth processes, resilience, and the interaction between humanity and the planet. The diversity of the courses presented here is intended to continue establishing exploration of different ways of knowing about resilience, as courses may take a Western and non-Western approach to studying the world.
2. *How can we design and implement resilient practices?* These courses facilitate exploration into how experts are working towards more sustainable practices and resilient Earth inhabitants by developing and implementing solutions. Traditionally, we consider scientists and engineers as those innovating solutions, but we aim to expand students' consideration of the breadth of expert stakeholders working towards resilience. Here, we go beyond developing solutions and provide opportunities for students to propose critical solutions and learn about how solutions are implemented.
3. *How do we ensure that resilience is equitable?* Innovative scientific, engineering, economic, and sociopolitical solutions and resources are often not allocated equitably to groups facing threats to being resilient. These courses were selected to expand students' ability to think critically about these challenges, such that they understand the context ('Why is this happening?'), are better equipped to grapple with the impact of inequity ('Who is benefitting? Who is harmed?'), and have a greater capacity to empathize.

We have selected existing courses that provide perspectives on answering these guiding questions that capitalize on the University of Arizona's position as a land grant and Hispanic Serving Institution. With the diversity of these courses and faculty expertise across campus and disciplines we can strengthen connections and collaborations in the service of student success and scholarship. Throughout the minor, students will engage in experiential learning and explore different thinking approaches – including data-driven analyses and trans-disciplinary ideas that can become the innovative practices of tomorrow.

Students will be able to carry their chosen independent research topic thread from the introductory course throughout each of these courses. We will provide an Honors assignment template to students and course instructors that can be used to complete Honors course requirements. This template will provide guiding questions for students to conduct independent research that explores their topic thread from the perspective of the course they've selected. For example, if a student chooses "Water in Arizona" as a topic thread and they elect to take AIS 431A: Traditional Ecological Knowledge, the student will conduct research that looks at how Native American Indians and Indigenous communities approach water conservation in Arizona. Individual course instructors will have the final say as to the course assignment to satisfy the Honors credit requirement, but will be encouraged to use the template.

A required cumulative-experience capstone class will focus on translating concepts learned during the minor program with an emphasis on solution design, application, and understanding intended and unintended impacts. Here, students will wrap up their independent research topic thread that has carried them through this program. Students will review each of their assignments that they completed to satisfy the Honors course requirements and reflect on how their knowledge and perspectives about this topic thread have changed. In the course's signature assignment, students will propose a solution that addresses an issue within their topic thread. They will articulate their justification for their proposed solution and outline how it could be implemented. Students will outline expected stakeholders, including who will benefit and who may be harmed, and explicitly address equity.

II. NEED FOR THE MINOR/JUSTIFICATION – *provide market analysis data or other tangible evidence of the need for and interest in the proposed minor. This might include results from surveys of current students, alumni, and/or employers or reference to student enrollments in similar programs in the state or region. Curricular Affairs can provide a job posting/demand report by skills obtained/outcomes of the proposed minor. Please contact the Office of Curricular Affairs to request the report for your proposal.*

The Honors College has recently deployed the new *Health and Human Values (HHV)* interdisciplinary minor as one way to offer unique degree pathways for Honors students. This minor offers students customizable, interdisciplinary pathways that afford students the ability to think and work on relevant societal challenges surrounding health, while also completing portions of their general education and required honors units. Students in the minor have found it to be one of the most rewarding aspects of their time at the University of Arizona. Below are excerpts of surveys from students enrolled in the *HHV* minor:

- “Through my education and experience in the *HHV* minor, I have developed a passion for women’s healthcare. The concepts learned through the *HHV* program can apply to all major disciplines, including law, engineering, business, technology, and more. Understanding how health and socioeconomic factors intertwine can lead to improvements across many social structures, not just hospitals. We can all stand to learn more about this subject and become more informed, empathetic, and compassionate people.”
- “*HHV* allows me to understand and interact successfully in new situations because I can think critically about the social and cultural environments that produce disease and health outcomes. With this mindset, medicine becomes the intersection of biomedicine, culture, and society.”
- “*The Health and Human Values minor has been one of the most important experiences of my undergraduate career.*”

Our goal is to continue to build these minor degree pathways for honors students that help them cultivate interdisciplinary reasoning and engage in applied and experiential learning opportunities. We hope to build on our current offerings and expertises at the Honors College and UA by exploring how humans interact with the planet in a changing environment. We designed the *Future Earth Resilience Minor* after the [17 United Nations Sustainable Development Goals](#) were agreed upon by all United Nation member countries as aspects necessary to provide “peace and prosperity for people and the planet” – or for the resilience of Earth and all of its inhabitants. These goals broadly focus on ensuring equity and access across the following areas for all at individual, regional, and country levels:

- Economic independence and opportunity for growth
- Food, water, and energy
- Health and well-being
- Education
- Human and social rights for all genders and marginalized populations
- Industry, innovation, infrastructure
- Responsible consumption, waste reduction, and environment conservation
- Climate resilience

- Inter- and intra-national partnerships

Few undergraduate minor programs aim to grapple resilience from such a broad and interdisciplinary perspective and address these global goals. Many programs have specifically focused on select aspects of these goals (e.g., climate change, public health, social justice) from an interdisciplinary perspective, like the popular new Climate Change and Society minor within the University of Arizona's School of Natural Resources and the Environment. However, the *Future Earth Resilience* minor aims to offer students the opportunity to holistically explore each of the focal areas of the UN's Sustainable Development Goals and expand their thoughts about resilience beyond an exploitative and human-centric viewpoint through courses selected as electives to fulfill the minor's requirements. Within this minor, students will gain an understanding of the ecosystem and the intersectional relationship between people and the environment, such that they are well-positioned to incorporate innovation and design principles to ensure resilience in the future. Students will have the opportunity to explore resilience through self-guided exploration, inquiry, and creative iteration.

Further, the top 7 social issues for Gen Z, according to [a poll by the Annie E. Casey Foundation](#), are: health care, mental health, higher education, economic security, civic engagement, race equity, and the environment. 76% of Gen Z respondents polled by [Pew Research](#) said that addressing the climate crisis is one of their biggest social concerns. A [poll performed by Amnesty International](#) found that 73% of respondents believe that "protection of human rights is fundamental to the future of the countries." This minor directly responds to the next generation of students' concern and their drive to address issues they believe to be most important, namely environmental, health, socioeconomic, and human rights resilience.

Chosen themes for *Future Earth Resilience* are well-aligned with the [University's Strategic Plan Pillars](#) and directly addresses many of the **Grand Challenges** posed in the Strategic Plan. The *Future Earth Resilience* minor grounds itself by exploring resilience via establishing an understanding of how we as humans interact with the natural and built environment, and by leveraging valuable research and engagement elements afforded by the UArizona Biosphere 2 science facility. We promote the broadening of student understanding of resilience by incorporating the expertise of the greater UArizona community to further showcase our **Institutional Excellence**. Since the minor is so interdisciplinary and one of the first of its kind, we expect that this minor will be a huge recruitment and retention opportunity for students within the Honors College to explore the resources and excellence throughout the university and contribute to the overall **Wildcat Journey**. We are driven to create a diverse, inclusive, equitable, and just learning environment and incorporate these principles in our program design, curriculum, and electives that can satisfy minor requirements. We have developed this program to highlight the value of work by intentionally including courses and foci on non-Western pedagogy and practices, like environmental intersectionality as it relates to Indigenous communities in Arizona in line with goals of the **Arizona Advantage** pillar.

Further, one of the overarching aims of the Sustainable Development Goals and the University of Arizona's Strategic Plan is to encourage design and implementation of action-driven solutions towards urgent challenges people are facing today. The in-development cumulative capstone course HNRS 4** will aim to address these challenges through an interdisciplinary lens. The course will encourage students to consider their experiences and all that they learned during the minor to answer "Now what?". Here, students will develop actionable ideas and proposals to address challenges in context with the Sustainable Development Goals. They will be asked to describe what and how solutions can be implemented, justify their ideas based on current understanding of the environment and a proposed solution's potential impact, and

contextualize these in a socioeconomic and political framework to think about who should be involved and what populations would be served. The approach and themes of this new capstone course and the proposed *Future Earth Resilience* minor directly addresses these global needs in a way that few other programs are doing. Thereby, the minor will further cement the University of Arizona as a leader of local and global resilience and align with investment and prioritization of the new Arizona Institutes for Resilience in the UA office of Research, Innovation, and Impact.

III. MINOR REQUIREMENTS

Minimum total units required	18
Minimum upper-division units required	9
Total transfer units that may apply to minor	9
List any special requirements to declare/admission to this minor (completion of specific coursework, minimum GPA, interview, application, etc.)	<ul style="list-style-type: none"> - Meet with departmental interview committee - Complete RNR 388

Minor requirements. List all required minor 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.

Core

- RNR 388 (3) Biosphere 2 Science, From Wonder to Discovery
- (NEW, In-development) HNRS 4** : Future Earth Resilience Capstone

Designated as "Core" in column A in the FER Courses_Submit_Edit.xlsx file

Electives

Complete 3 units from the courses that explore *"How can we explore the evolution of the relationship between earth processes and people?"* designated as "EP" in column A in the FER Courses_Submit_Edit.xlsx file

Complete 3-6 units from the following that explore *"How can we design and implement resilient practices?"* designated as "DI" in column A in the FER Courses_Submit_Edit.xlsx file

Complete 3-6 units from the following that explore *"How do we ensure that resilience is equitable?"* designated as "QT" in column A in the FER Courses_Submit_Edit.xlsx file

Internship, practicum, applied course requirements (Yes/No). If yes, provide description.	No
Additional requirements (provide description)	No
Any <u>double-dipping restrictions</u> (Yes/No)? If yes, provide description.	No

IV. CURRENT COURSES—using the table below, list all existing courses included in the proposed minor. You can find information to complete the table using the [UA course catalog](#) or [UAnalytics](#) (Catalog and Schedule Dashboard> “Printable Course Descriptions by Department” On Demand Report; right side of screen). If the courses listed belong to a department that is not a signed party to this implementation request, upload the department head’s permission to include the courses in the proposed minor and information regarding accessibility to and frequency of offerings for the course(s). Upload letters of support/emails from department heads to the “Letter(s) of Support” field on the UAccess workflow form. Add rows to the table, as needed.

Included as an attached spreadsheet. **Column A ‘Designation’ was added to more clearly show which electives fell under which topic of exploration.**

V. NEW COURSES NEEDED – using the table below, list any new courses that must be created for the proposed program. If the specific course number is undetermined, please provide level (ie CHEM 4**). Add rows as needed. Is a new prefix needed? If so, provide the subject description so Curricular Affairs can generate proposed prefix options.

Course prefix and number (include cross-listings)	Units	Title	Course Description	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Status*	Anticipated first term offered	Typically Offered (F, W, Sp, Su)	Dept signed party to proposal? (Yes/No)	Faculty members available to teach the courses
HNRS 4**	3	Future Earth Resilience Capstone		RNR 388	In-person	D	Spring 2023	T, Th	Yes	Caitlyn Hall

*In development (D); submitted for approval (S); approved (A)

Subject description for new prefix (if requested). Include your requested/preferred prefix, if any:

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

Faculty Member	Involvement	UA Vitae link or “CV attached”
Caitlyn Hall	Program chair, Will Teach HNRS 4**	CV attached

John Pollard	Faculty advisor	CV Attached
Kevin Bonine	Teaches RNR 388	CV attached
Joost van Haren	Faculty advisor	CV attached
Kailey Shill	Academic Advisor	Resume attached
Marco Quintero	Program Coordination	Resume attached

VII. STUDENT LEARNING OUTCOMES AND CURRICULUM MAP — *describe what students should know, understand, and/or be able to do at the conclusion of this minor. Work with [Office of Instruction and Assessment](#) to create a curricular map using Taskstream. Include your curricular map in this section (refer to Appendix A for sample Curriculum Map generated using Taskstream).*

(MAP Attached)

Outcomes:

1. Translate concepts to develop actionable solutions to real-world challenges for resilience, while demonstrating an understanding of cultural values and complex regional, national, and global challenges.
2. Apply and incorporate interdisciplinary problem solving individually and through collaboration.
3. Contextualize the intersectionality of resilience considering diverse perspectives across scientific, social, economic, political, environmental, and cultural value systems using concepts of interrelatedness and systems level thinking.
4. Understand broad intended and unintended impacts of sustainability and resilience efforts for stakeholders.

Curriculum Map:

VIII. ASSESSMENT PLAN FOR STUDENT LEARNING- using the table below, provide a schedule for program assessment of intended student learning outcomes 1) while students are in the program and 2) after completion of the minor. Add rows as needed.

Learning Outcomes	Sources(s) of Evidence	Assessment Measures	Data Collection Points
<p>Translate concepts to develop actionable solutions to real-world challenges for resilience, while demonstrating an understanding of cultural values and complex regional, national, and global challenges.</p>	<p>Honors Contract Elective Template: Will include guiding questions to address these points from the perspective of their elective courses</p> <p>RNR 388: Honors section-embedded assignments; Survey</p> <p>HNRS 4**: Course-embedded assessments; reflection assignments; exit survey</p>	<p>Completed Honors Contract Template papers that guide research and reflection.</p> <p>RNR 388 and HNRS 4**: Reflection and research assignments that culminate in a paper and project.</p>	<ul style="list-style-type: none"> ● Beginning of RNR 388 ● During each of the Honors contract assignments following the FER program template completed for their elective courses ● End of HNRS 4**
<p>Apply and incorporate interdisciplinary problem solving individually and through collaboration.</p>	<p>Honors Contract Elective Template: Will include guiding questions to address these points from</p>	<p>Completed Honors Contract Template papers that guide research and reflection.</p>	<ul style="list-style-type: none"> ● Beginning of RNR 388 ● During each of the Honors contract assignments following the FER program

	<p>the perspective of their elective courses</p> <p>RNR 388: Honors section-embedded assignments; Survey</p> <p>HNRS 4**: Course-embedded assessments; reflection assignments; exit survey</p>	<p>RNR 388 and HNRS 4**: Reflection and research assignments that culminate in a paper and project.</p>	<p>template completed for their elective courses</p> <ul style="list-style-type: none"> ● End of HNRS 4**
<p>Contextualize the intersectionality of resilience considering diverse perspectives across social, economic, political, environmental, and value systems using concepts of interrelatedness and systems level thinking.</p>	<p>Honors Contract Elective Template: Will include guiding questions to address these points from the perspective of their elective courses</p> <p>RNR 388: Honors section-embedded assignments; Survey</p> <p>HNRS 4**: Course-embedded assessments; reflection assignments; exit survey</p>	<p>Completed Honors Contract Template papers that guide research and reflection.</p> <p>RNR 388 and HNRS 4**: Reflection and research assignments that culminate in a paper and project.</p>	<ul style="list-style-type: none"> ● Beginning of RNR 388 ● During each of the Honors contract assignments following the FER program template completed for their elective courses ● End of HNRS 4**
<p>Understand broad intended and unintended impacts of sustainability and resilience efforts.</p>	<p>Honors Contract Elective Template: Will include guiding questions to address these points from the perspective of their elective courses</p>	<p>Completed Honors Contract Template papers that guide research and reflection.</p> <p>RNR 388 and HNRS 4**: Reflection and research</p>	<ul style="list-style-type: none"> ● Beginning of RNR 388 ● During each of the Honors contract assignments following the FER program template completed for their elective courses

	RNR 388: Honors section-embedded assignments; Survey HNRS 4**: Course-embedded assessments; reflection assignments; exit survey	assignments that culminate in a paper and project.	<ul style="list-style-type: none"> End of HNRS 4**
--	---	--	---

VII. ANTICIPATED STUDENT ENROLLMENT-complete the table below. What concrete evidence/data was/were used to arrive at the numbers?

5-YEAR PROJECTED ANNUAL ENROLLMENT					
	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
Number of Students	15	30	45	60	85

Data/evidence used to determine projected enrollment numbers:

Enrollment is similar to peer institutions shown for comparison, as well as the University of Arizona’s minor, Climate and Society.

VIII. ANTICIPATED MINORS AWARDED- complete the table below, beginning with the first year in which minors will be awarded. How did you arrive at these numbers? Take into consideration departmental retention rates.

5-YEAR PROJECTED MINORS AWARDED ANNUALLY

	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
Number of Minors	0	10	25	40	55

Data/evidence used to determine number of anticipated minors awarded annually:

Enrollment is similar to peer institutions shown for comparison, as well as the University of Arizona's minor, Climate and Society.

XI. PROGRAM DEVELOPMENT TIMELINE- *describe plans and timelines for 1) marketing the minor and 2) student recruitment activities.*

1) Marketing

During the first year, we will advertise through different Honors College communication channels (e.g., weekly newsletter, social media posts, during orientations/information sessions, Honors College website). We will ask Honors College advisors to share this information with students they feel would be interested and a good fit for the program. We will send flyers and information packets to all faculty and staff affiliated with the Honors College, with the courses and departments that have been selected and approved for the minor program, and with the Biosphere 2 cross-campus Faculty Innovative Teaching Fellows. We will advertise this program yearly and update our marketing strategies based on feedback and what we find to be successful, based on student and advisor feedback.

2) Student Recruitment Activities

We will reach out to different related student clubs, affiliated faculty and departments (i.e., those who have shown support by instructing or housing electives to satisfy the minor), and Honors communication channels to promote the minor. For example, we will reach out to clubs like Students for Sustainability and units like the Office of Sustainability and the Arizona Institute for Resilience. We will also reach out to students interested in that would greatly contribute to the planet's future resilience. The current Honors minor, *Health and Human Values*, has an affiliated club (designated through ASUA) and we will encourage the formation of a similar organization for *Future Earth Resilience*. Here, students will be able to attract students to join the program and form a community to encourage program retention.

XII. DIVERSITY AND INCLUSION-describe how you will recruit diverse students and faculty to this minor. In addition, describe retention efforts in place or being developed in order to retain students.

When discussing '[resilience](#)' many may interpret this as a '[pull yourself up by your bootstraps](#)' mentality and that one's success or failure to overcome an obstacle is a result of their character or worth. This is a particular issue when discussing the impacts of systemic racism and other issues that put responsibility on the person suffering. When developing this minor, we particularly emphasized that this is not the message we want to send or imply about resilience, nor to students about what it means to be resilient. We worked to design *Future Earth Resilience* with diversity, equity, inclusion, and justice (DEIJ) at the forefront. We will demonstrate our commitment to incorporating DEIJ through the variety of courses that we include that range from exploring sustainable Indigenous agriculture practices, to addressing how global womens' health is critical to global resilience, to environmental ethics. By ensuring our inclusion of non-Western and non-dominant perspectives when discussing aspects of resilience, we hope to create a more inclusive environment to those that identify as being members of a non-dominant group. Here, we're able to emphasize knowledge approaches, ways of knowing, and broader perspectives that have served people for thousands of years. Further, we understand the diverse interests, needs, and background of students and will allow for flexibility for petitions to satisfy the elective requirements of the minor via student petition.

We recognize that while the diversity in the Honors College (and higher education broadly) is growing, it is still white dominated. We will work with our Assistant Dean for Programs, Diversity, and Inclusion, Dr. Cheree Meeks, and other staff at the Honors College to further outreach to diverse high schools, colleges, and departments to support and encourage diverse students to join the Honors College. One of the major goals of this minor beyond educating students is to provide an inclusive space, such that they want to stay in the program and at the University. During this minor, we aim to engage early and often with students to ensure that their time in the program and at the University of Arizona is supporting their personal and professional development. We will work to ensure that opportunities are available to all students and will support their ideas

and drive to the best of our abilities. For example, if a student is interested in an internship opportunity working with a local organization to ensure equitable access to food, we will support and try to facilitate their ideas. By providing direct support to the students at an individual level, we hope that we will be able to retain students in the program. Further, we will connect to work with the many student groups and programs already working on these issues, including the Office of Early Academic Outreach, student clubs focused on cultural identities, and the Office of Student Engagement.

We will explore DEI in the Honors section of RNR 388 and survey student interest to capture changing priorities and values with each cohort, to reflect current events. During the proposed HNRS 4**, the minor program culminates with “Now what?” guiding student-driven inquiry. Herein, we will revisit students' aggregated and individual responses when students enter the minor and discuss how their views may have changed during the time in the program. We will also ask them for feedback on the program using different survey techniques (e.g., discussion-based Stop-Start-Continue) so that we can iterate and improve upon the program. Also in this course, we will also continue to center DEI, interdisciplinarity, and diverse perspectives by facilitating student exploration of what resilience means and how we achieve it. Students will think critically about problems, solutions, benefits, and unintended consequences in the short- and long-term, such that they gain an appreciation for DEI and the complexity of all these issues.

Designation	Course prefix and number (include cross-listings)	Units	Title	Course Description	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Typically Offered (F, W, Sp, Su)
DI	AIS 426A	3	Principles of Indigenous Economics	Indigenous and aboriginal peoples in the Americas developed distinctive economic systems prior to contact with Europe. As the world economic system developed, indigenous peoples attempted to preserve their ways of life as best they could, with some success. This course examines the ontological, epistemological and moral bases of indigenous economic theory with application to contemporary problems.	None	In-person, Live Online (semester dependent)	Main campus: Fall, Spring; Tu
QT	AIS/ANTH/ARL/ENVS/ RAM/ RNR/SWES/WSFC/ W SM 441A	3	Natural Resource Management in Native Communities	This course is a survey of basic issues and concepts in natural resource management and the environment in Native communities using integrated case studies that survey all the major varieties of environmental issues in Indian Country in the 21st century. A central theme will be developing tribally-specific solutions to rebuilding the resiliency of degraded ecosystems. We will consider particular case studies such as: tribal sovereignty, land tenure, reserved rights and Native claims; Native knowledge systems and Western science; co-management and restoration; water; fish and wildlife; agriculture and rangeland management; energy, mining and nuclear waste; and global climate change.	None	In-person, Live Online (semester dependent)	Main campus: Fall, Spring; W
EP	AIS/ANTH/ENVS/GEO G/RAM/WFSC/WSM 431A	3	Traditional Ecological Knowledge	An introduction to the growing literature on traditional ecological knowledge and its relationships to the ecological and social sciences.	None	In-person, Live Online (semester dependent)	Main campus: Fall; W
EP	ANTH 307	3	Ecological Anthropology	Cultural adaptation with emphasis on the systematic interaction of environment, technology, and social organization among hunter-gatherers, nomadic herders, and peasant farmers.	None	In-person, Online (semester dependent)	Main campus: Fall, Spring, Summer; TuTh
QT	ANTH 438	3	Women's Health in Global Perspective	Biocultural perspective on health issues/risks women face around the world using a life cycle approach beginning with the birth of girl babies through the aging process.	ANTH 265 or ANTH 200 or consent of instructor.	Online	Main campus: Fall, Spring, Summer
DI	ARC 461A	3	Water Efficiency in Buildings	Learn methods and advanced techniques that conserve urban water usage while promoting water harvesting, water reuse, and water energy generation technologies in and around buildings.	Upper division undergraduate student, graduate standing or permission of instructor.	In-person, Online (semester dependent)	Main campus: Fall; Th

EP	ATMO 336	3	Weather, Climate and Society	The course examines basic weather phenomena, climate and climate change, and the associated effects on individuals and societies in the past and present. The possibility and effects of human-caused changes in the climate system are also discussed.	Two courses from Tier One, Natural Sciences (Catalog numbers 170A, 170B, 170C).	In-person, Online (semester dependent)	Main campus: Fall, Spring, Summer; TuTh
EP	ATMO 436A	3	Fundamentals of the Atmospheric Sciences	Broadly covers fundamental topics in the atmospheric sciences. Topics include composition of the atmosphere, atmospheric thermodynamics, atmospheric chemistry, cloud physics, radiative transfer, atmospheric dynamics, and climate.	None	In-person, Online	Main campus: Spring; MWF; Online campus: Spring
DI	BE 482	3	Integrated Engineered Solutions in the Food-Water-Energy Nexus	Integrated engineered solutions in the Food-Water-Energy Nexus are transformational integrated designs -- drivers of change -- that are necessary to make feeding an increased global population this century possible, environmentally sustainable and cost-effective.	Adv Stgd: Engineering.	In-person	Main campus: Fall; TuTh
DI	CHEE 204	3	Water and Energy: Conventional and Alternative Systems	Where does the energy come from to light a building or power an air conditioning system? Where does the water in your facet originate and what treatment/processing has been required? Where does the water go when you flush the toilet or drain a bathtub? How do we distribute water and energy from central facilities to individual homes and businesses? How do we avoid running out of water and energy for urban use? This course will provide the fundamental information on water and energy systems and provide students with a broad education as to the past, present, and future considerations for sustainable water and energy system technologies. Human population growth and increasing urbanization are stressing conventional water and energy resources. Sustainability will require the continued exploration of renewable and alternative sources of water and energy. In addition, water and energy systems are intrinsically and symbiotically related. This course will explore the history, present, and future of these systems with an emphasis on the technologies for alternative energy and water. Key areas for discussion will include atomic, solar, hydro, and wind energy system technologies, as well as water reuse and desalination. Through this course, students will become familiar with the primary sources of water and energy and the systems and technologies used for production and conveyance. The course will discuss how water and energy systems have developed and will evolve using case studies in each section of the class. Scenario discussions will debate pros and cons of each approach including cost, feasibility, and sustainability. Students completing this course will gain a strong understanding of the water and energy systems used to sustain urban growth and development, as well as a vision of the future related to challenges and potential solutions for sustainability. Course not acceptable as a technical elective or an engineering elective for engineering majors.	None	In-person, Online	Main campus: Spring; TuTh

EP	ECOL 206	3	Environmental Biology	Fundamentals of ecology and their relevance to human interconnectedness with natural ecosystems. Non-majors orientation.	Two courses from Tier One, Natural Sciences (Catalog numbers 170A, 170B, 170C).	Online	Main campus: Fall, Spring, Summer
EP	ECOL 480	3	Mathematical Models in Biology	For advanced undergraduates and graduate students in biological and ecological sciences, and math students: learn how to apply basic tools of mathematical tools (from simple back-of-the-envelope estimates to formal stability analysis using difference and differential equations) to biological problems including population dynamics, species coexistence, population genetics, links between ecosystems ecology and Global biogeochemistry, and biological scaling.	MATH 129.	In-person and Flex	Main campus: Spring; TuTh
DI	EHS 425	3	A Public Health Lens to Climate Change	How does a changing environment affect human health? What is the public health role in mitigating and addressing these implications? Why is a public health lens both relevant and necessary? Students in this course will directly interact with these questions and explore the fundamentals of global environmental change with a focus on climate change. Course topics include climate change, impacts on human health, policy development, adaptation and mitigation, health equity, and climate action co-benefits.	None	Online	Main campus: Fall, Spring; Online campus: Fall, Spring
QT	EHS 426	3	Topics in Environmental Justice	This course will provide an introduction to environmental justice concepts as they apply to public health. Issues relating to race/ethnicity, gender, social class, environmental policy and law will be used to critically examine environmental health disparities.	None	In-person	Main campus: Fall; TuTh
DI	EHS 489	3	Public Health Preparedness	This course will provide the participants a basic knowledge of public health preparedness and response using an all hazards approach: nuclear, biological, chemical, and natural disaster, and an opportunity to apply this content in a mock critical incident event .	None	In-person	Main campus: Fall; Tu
DI	ENGR/ENTR 420R	3	Innovation Principles and Environments	Overview of entrepreneurial approach, strategies, and skills within a range of environments to advance technology and innovations. Students can pair ENTR 420R/520R with lab course to develop innovation-specific feasibility study or business plan.	None	Online	Main campus: Spring, Summer
EP	ENVS 270	3	Critical Zone Science	The critical zone is defined as the "heterogeneous, near surface environment in which complex interactions involving rock, soil, water, air, and living organisms regulate the natural habitat and determine the availability of life-sustaining resources". Extending from the top of the vegetation canopy through the groundwater table, the critical zone supports nearly all terrestrial life on Earth. The critical zone provides us with clean air, drinkable water, fertile soil and much more. However, human activity has changed the structure and function of the critical zone by altering its constituent parts: the atmosphere, lithosphere, hydrosphere and biosphere. Now more than ever, understanding the critical zone is crucial to human flourishing and sustainability. This course integrates core concepts of geology, hydrology, ecology and soil science to provide a foundational understanding of the critical zone and its role in addressing environmental problems.	Introductory Course in Environmental Science or Instructor Consent.	In-person	Main campus: Spring; TuTh

QT	ENVS 310	3	Ecosystem Health and Justice	<p>Across America, one in four Americans lives within 3 miles of a hazardous waste site (U.S. General Accounting Office, 2013). This means that one's zip code can be more important than their genetic code. Today's complex environmental health and justice challenges have far-reaching impacts and require an ability to interweave different data sources to build connections across disciplines and social positions. Students will learn how using an environmental justice framework and merging different datasets and forms of knowledge can uncover the underlying assumptions (inequality, distribution of power and privilege, oppression/marginalization) that contributes to and produces unequal protection. Students will learn from diverse individuals who are generating creative and systems-based environmental health solutions. After the course, students will demonstrate an ability to build connections among various stakeholders and use multiple perspectives to solve challenges. Students will not only gain a fundamental understanding of environmental science and legislation, public health, and justice, they will build connections and apply the ecological model of health to design solutions at the intrapersonal, interpersonal, institutional, and community levels to create a more equitable society.</p>	2 courses from Tier One - Individuals / Societies.	In-person	Main campus: Fall; MWF
DI	ENVS/LAR/PLG 450	3	Green Infrastructure	<p>The goal of this course is the advancement of students' knowledge and capabilities regarding Green Infrastructure concepts and the issues and techniques involved in implementation of Green Infrastructure. The course provides an overview as well as more in-depth coverage of the science, practical context, and creation of Green Infrastructure. The built environment of arid regions is emphasized, with Tucson Case Studies providing practical focus to content and learning objectives. The term Green Infrastructure, as used in this course, aligns with the following EPA description: "Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments... at the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up and storing water." The course features lectures, interactive discussions and presentations, and guest presentations and tours led by experts in their fields. Students take a series of quizzes, a mid-term and a final exam, along with a number of homework assignments / exercises. A special research report is required of Graduate Students.</p>	Prior coursework in related fields is recommended along with familiarity with office productivity software tools (Excel & PowerPoint) along with research, analytic, and writing skills.	Online	Main campus: Fall
DI	GEOG 230	3	Our Dynamic Climate	<p>Climate change is among the most important issues of our time. In this course students will learn and apply the perspective of the climate scientist to answering questions about the natural systems, physical processes, and human dimensions of climate change, its impacts, and pathways to solutions. Students will put this perspective into practice using the tools and approaches of the climate scientist, working with quantitative information such as analyzing and interpreting data, as well as linking science to solutions through interactive activities.</p>	None	In-person, Online (semester dependent)	Main campus: Fall; MWF
EP	GEOG 240	3	Our Dynamic Landscape	<p>Critical perspectives on complex environmental problems; issues include environmental hazards, renewable and nonrenewable resources; global, regional, and local patterns, and geographic scale are emphasized.</p>	None	In-person	Main campus: Fall; MWF

EP	GEOG 338	3	Biogeography	Biogeography is the study of the spatiotemporal distribution of living things. Biogeographers map and examine the distributions of organisms today and reconstruct those of the past. They also conduct research into how physical and biological factors and processes influence distributions of organisms and they study how geographic distributions affect the evolution and extinction of species. Earth is a dynamic, wondrous, and complex planet. The diversity we see in the living systems, i.e. the Earth's biosphere, is the result of many processes studied individually among many disciplines including hydrology, geology, ecology, and soil science. In this course, we will take a holistic and integrative look at the complex spatial variations in the elements of Earth's biosphere. This course is designed to explore how biogeographic processes influence the evolution of species, communities, and ecosystems and provides background and analytical techniques for studying the effects of global change on biota. This involves the study of the interplay between biota and environment through time and space. This course will combine evolutionary and ecological perspectives in the field of biogeography and show how Earth history, contemporary environments, and evolutionary and ecological processes have shaped species distributions and nearly all patterns of biodiversity. General patterns in space and time from a diversity of organisms across the Earth's aquatic and terrestrial ecosystems will be used to illustrate this broad field of biogeography.	None	In-person, Online (semester dependent)	Main campus: Fall; MWF
QT	GEOG/AICS/EVS 374	3	Geography, Social Justice and the Environment	Introduction to theories of social justice with application to social, cultural, and economic geography. What are the prevailing theories of social justice and how can we draw on them to assess movements and goals for social change? How do different geographical contexts inform our assessment of social justice concepts? Course will address theory, moral questions, and specific case studies equally.	None	In-person	Main campus: Fall, Spring; MW
DI	GEOG/EVS 302	3	Introduction to Sustainable Development	Introduction to Sustainable Development is a foundational course in understanding the policies and strategies that constitute "smart" regional development in US metropolitan areas.	None	In-person	Main campus: Fall, Spring; TuTh
DI	GEOG/EVS 304	3	Water, Environment, and Society	The course explores human and natural systems and their dependence on freshwater at multiple scales. Topics of interest include global change, ecosystem services, groundwater, urbanization, land use, watershed and river basin management, stakeholder processes, and water policy.	None	In-person	Main campus: Fall, Spring; MWF
DI	GEOG/EVS 363	3	Climate Change: Human Causes, Social Consequences and Sustainable Responses	Climate change has social causes and consequences, and the responses and solutions involve changes in human behavior, institutions, and technologies. This course analyses the social causes of climate change including the economic, political, social and cultural drivers of greenhouse gas emissions and land use, and the impacts of climate change on society such as vulnerability and impacts in sectors such as food, water, health, cities and sustainable development. It also discusses solutions and responses to climate change such as changing policies, behavior and attitudes, climate mitigation and adaptation, and the role of governments, cities, the private sector, social movements and individuals from the local to the global level.	None	Live Online	Main campus: Fall, Spring; TuTh
DI	GEOG/EVS 368	3	The Green Economy	The Green Economy. What is it and how does it function? What does it mean for our future? What are the implications for cities, community, and globalization? What kind of policies lay the foundation for green economic development, and what challenges and opportunities lie within? And what does 'green' mean anyway? This course is a challenging exploration into the day-to-day practices and policies of the green economy, particularly in the United States and the Southwest. The class will be devoted to understanding how the green economy functions and why, through readings, lectures, visiting speakers, and field studies.	None	In-person	Main campus: Fall; TuTh
QT	GEOG/PLAN/PLG/PLN/PLNN/PLNG 379	3	Urban Growth and Development	Location patterns in urban areas and processes of growth; historical development of U.S. cities, rent theory, housing markets, commercial and industrial location, the role of transportation, urban finance, New Urbanist planning and sustainable development concepts.	None	In-person	Main campus: Fall, Spring; TuTh

EP	GEOG/PLG/EVS/HWR /HWRS/LAS/PLAN/PL N/PLNG/PLNN/WRA 461	3	Environmental and Resource Geography	Examines physical resources (e.g. distribution, quantities, and availability) and the human factors which may contribute to their completion and deterioration as well as protection and maintenance.	None	In-person	Main campus: Spring; TuTh
EP	GEOS 212	3	Introduction to Oceanography	Introduces the oceans and their geological, physical, chemical and biological processes with emphasis on their history and formation and the interactions of humans with the marine environment.	None	In-person and Online	Main campus: Fall, Spring; TuThF
QT	HWRS 203	3	Arizona Water Issues	Study of the use and misuse of water throughout Arizona and the fundamental tools used to study water supply, quality, and conservation. Introduction to basic hydrologic principles to help students deal with issues they will encounter later as public citizens in their own communities.	None	In-person	Main campus: Fall, Spring; TuTh
EP	HWRS 350	3	Principles of Hydrology	Introduction to the hydrologic cycle and review of main processes, such as precipitation, evaporation and transpiration, runoff, infiltration and ground water. Some concepts and tools for water resources management are discussed. Laboratory techniques complement lecture topics.	MATH 124 or MATH 125 or MATH 122B.		Main campus: Fall; TuTh; Online campus: Fall
QT	HWRS 443A	3	Risk Assessment for Environmental Systems	A multidisciplinary course based on evaluating risk as the loss expected from environmental catastrophes or from the failure of systems designed for environmental protection. Examples will be drawn from hydrology, atmospheric science, and geology. The emphasis is on adapting the tools of probabilistic risk assessment to environmental analyses. Graduate-level requirements include a written review of a seminal paper and its presentation in class.	SIE 305 or MATH 361 or MATH 363 or equivalent calculus- based probability /statistics course.	In-person	Main campus: Fall; TuTh
QT	NAFS 365	3	The Food Economy - Efficiencies, Gaps and Policies	This course familiarizes students with the food economy and its efficiencies while identifying where gaps occur as food flows from producers to consumers. These gaps frequently lead to food insecurity with a less healthy populous, as well as food waste, an issue in more developed societies. By examining 1) the food supply chain and markets, 2) food insecurity, 3) food loss and waste along the food supply chain and 4) food policies, students will gain insights into the economic forces that shape the food system. This course stimulates critical thinking and problem solving through economic and policy perspectives, which may lead to potential resolutions for those who struggle to afford and consume healthy, wholesome foods.	None	In-person, Flex In- person	Main campus: Fall, Spring; TuTh
DI	PA 482	3	Environmental Governance	This course introduces the concept of sustainable development as a policy goal, and explores the complex role of governance systems in promoting or inhibiting sustainability. Four major barriers to environmental sustainability are examined, including: 1) path dependency of policy choices, 2) collective action dilemmas, 3) conflicts over values and beliefs, and 4) the difficulty of translating scientific knowledge about coupled human and natural systems into effective policy solutions. This course emphasizes the understanding of practical solutions to problems of sustainability that are grounded in theories of public policy and management.	None	In-person	Main campus: Fall; M

QT	PHIL/PA 323	3	Environmental Ethics	Students in this course will investigate and seriously consider how and why we should live as morally responsible members of an ecological community. Students will explore philosophical responses to questions such as: What makes something natural? What value is there to non-human entities? What obligations do we have to each other regarding the environment? How should we respond to catastrophic environmental change?	None	In-person	Main campus: Fall, Spring, Summer; TuTh; Online campus: Fall, Spring, Summer
QT	PLG 408	3	Climate Action Planning	Cities are on the frontlines of climate change as they emit the majority of the world's greenhouse gasses and are increasingly impacted by sea level rise, floods, drought, extreme heat, and wildfire. This course explores climate action planning and the challenges and opportunities of planning for more sustainable and resilient cities. Students will learn about greenhouse gas emissions accounting, vulnerability assessments, localized climate change projections, climate impacts, and how cities can both mitigate greenhouse gas emissions and plan for climate adaptation. Climate action planning will be considered through a variety of professional disciplines and scales including neighborhoods, cities, and regions. This course emphasizes inclusive and equitable planning processes that engage those most vulnerable to climate impacts.	None	In-person or Live Online (semester dependent)	Main campus: Spring; Tu
DI	PLG 473	3	Transportation & Society	This course facilitates student exploration of key concepts and issues related to how transportation systems impact cities and communities. Students will explore ways that transportation systems both in the United States and around the world affect urban growth and development, economic performance, public health outcomes, social equity and social justice, and the natural environment.	None	In-person	Main campus: Fall, Winter, Spring, Summer; W
QT	PLG/GEORG/PLN/PLN N 497S	3	Sustainable Urban Development and Design	Examines contemporary competition between environment, resources (water, energy), social equity, and economic viability in the community development and revitalization arena. Public policy, planning initiatives, design strategies and technical solutions that bridge the conflicting agendas are analyzed. Field investigation of contemporary cases. Appropriate for students specializing in planning, architecture and landscape architecture.	None	In-person	Main campus: Fall; M
QT	RELI 360	3	Religion, Nature, and Climate Change	This course explores the relationships between humans, religious traditions, and the environment. We will examine how a variety of religious traditions have shaped human relationships with nature, how the natural world has influenced religious beliefs and practices, and how religions influence people's understanding of and responses to climate change.	None	In-person	Main campus: Fall, Spring; TuTh
QT	RELI 407	3	Religion, Spirituality, and the Sacred in Native North America	This course critically explores the categories of "religion," "spirituality," and "the sacred" as they relate to American Indian communities, traditions, lifeways, histories, narratives, ceremony, and land. Focusing on both the plurality of indigenous lifeways and shared characteristics, some major topics that will be examined include the role of religion both in the colonization of Native people as well as in resistance to colonization, the importance of land/place/ecosystem and conceptions of sacred space, and issues of religious freedom and the fight for traditional land. Throughout we will analyze the efficacy of the terms "religion" and "spirituality" as well as engage with concerns regarding the academic study of Native American religions more broadly.	None	In-person	Main campus: Spring; Dates TBD

CORE	RNR 388	3	Biosphere 2 Science, From Wonder to Discovery	Welcome to Biosphere 2 Science, from Wonder to Discovery. Our focus will be on science that informs our understanding of Earth systems, including exciting research only possible at Biosphere 2. Key themes that you will explore and experience include diverse research methods, scale and control, models and inference, data science, systems thinking, microbiology drivers, climate change, and ecosystem services including the provisioning of food and water for humans. Earth systems research and implications for healthy, equitable human societies is inherently interdisciplinary. Therefore, this course is of relevance for many careers, majors housed in several colleges; participating faculty also represent multiple UArizona colleges. Our course moves through several examples and problem sets or mini-projects with leading scientists that include the key themes for understanding planet Earth. By the end of the course you will have a valuable science-practice tool kit and way of thinking applicable to a wide variety of professional pursuits.	None	In-person	Main campus: Fall Dates TBD
DI	RNR 340	3	Conservation and Agriculture in the Southwest	Agriculture and ranching have had a significant impact on the history and environment of the western United States. In popular culture, ranching is viewed both as a romantic representation of our western, pioneer heritage and as a symbol of environmental destruction. This course examines how modern agriculture and ranching fits with these perceptions by developing an understanding of what has been termed "conservation ranching." We will review how agriculture is practiced in the Southwest and the relationship between agriculture and sustainable land use. The focus is on ranching because it is the predominant land use in rural Arizona and other western states, but we will touch on sustainable farming practices throughout the semester.	None	In-person	Main campus: Spring; TuTh
DI	RNR 440	3	Climate Change Adaptation: Perspectives at the Nexus of Science, Society, & Resource Management	Much of modern society's experience of managing resources and protecting people and infrastructure has occurred during a period of relatively stable climate. In the most recent decades in the Southwest, we have observed a cascade of impacts associated with temperature increases, including changes in snow hydrology, urban heat, wildland fire, and in the severity of drought impacts. Projected future climate changes and impacts may lie outside the range of climate variation that we have observed and may have more serious consequences for society and the environment. Anticipating changes will allow society to identify response options across a range of vulnerabilities and manage the risks associated with projected climate changes. In the best possible cases, these actions, or adaptations, may provide economic and other benefits to society.	None	In-person or Live Online (semester dependent)	Main campus: Fall; Th
DI	RNR/LAR 448	3	Conservation Planning & Wildland Recreation	This course will introduce the concepts and techniques used in the growing field of human use management in outdoor recreation settings. The focus is on the sociological dimensions of the recreation experience and an understanding of the principles, practices, and dilemmas of outdoor recreation management in natural areas.	None	Online	Main campus: Fall, Spring
EP	RNR 458	3	Ecosystem Ecology and a Sustainable Future	Rapid changes to Earth's biosphere will influence how natural and managed ecosystems function and alter the services they provide. Issues from conservation biology to sustainability and global climate change rely on a comprehensive understanding of ecosystem processes. In this class, students will learn the principles of terrestrial ecosystem ecology, examining the influence of biological, ecological, and physical processes on energy and material flows and water and elemental (carbon, nitrogen, phosphorous) cycling in ecosystems. Graduate level requirements include an additional project and leading class discussions.	RNR 316 or ECOL 302 or permission of instructor.	In-person or Live Online (semester dependent)	MoWe
EP	RNR/GEOG/GIST/SW /SWES 417	3	Geographic Information Systems for Natural and Social Sciences	Introduction to the application of GIS and related technologies for both the natural and social sciences. Conceptual issues in GIS database design and development, analysis, and display.	None	In-person or Flex	Main campus: Fall, Spring, Summer; MW; Online campus: Fall, Spring, Summer

DI	RNR/PA 485	3	The Economics & Social Connections to Natural Resources	The economics and social connections to environmental systems and their problems offers an important insight into the use, misuse, and overuse of natural resources. This course examines economic theory, concepts, and decision-making tools for real-world problems and possible solutions. The course is intended for students studying natural resources, environmental science, social sciences, public policy, public administration, and other disciplines interested in this perspective. Descriptive, graphical, and elementary quantitative methods will be used throughout the course.	None	In-person or Flex	Main campus: Spring; MW
DI	SIE 466	3	Life Cycle Analysis for Sustainable Design and Engineering	This course will provide senior undergraduate and graduate students the conceptual, methodological, and scientific bases to quantify and reduce the impact of engineering decisions on the environment, with a focus on applying life cycle analysis (LCA) to support the material choice, product/process design, and manufacturing/engineering decisions. Main topics covered include concept of life cycle thinking, computational structure of LCA, process and economic input-output based LCA, LCA software demonstration, LCA case studies, environmental product declaration, and recent development and advanced topics in LCA.	None	In-person or Live Online	Main campus: Fall, Summer; TuTh; Online campus: Fall, Summer; Distance campus: Fall, Summer
QT	SOC/CHS 350	3	Environment, Health, and Society	This course examines the relationships between human health and the environment from a sociological viewpoint. Using an interdisciplinary sociological perspective, we will explore the increasing number of illnesses linked to environmental contamination and disasters. Since this is a course in the social sciences, only a basic understanding of the biological and chemical nature of environmental pollution will be needed. Our focus will be on the socioeconomic production of environmental health risks and how science and public policy are contested by various stakeholders.		In-person or Flex	Main campus: Fall, Spring; MW; Online campus: Fall, Spring
QT	SOC/CHS 405	3	Disasters, Health & Society	Disasters can be triggered by all sorts of causes: from forces of nature, such as viruses, floods, wildfires, hurricanes, and earthquakes; to technological accidents, such as plane crashes, oil spills, and chemical releases; or terrorism and acts of violence. Disasters may be slow-moving in their onset or sudden and unexpected. But what all types of disasters have in common is the potential to cause widespread community disruption, displacement, economic loss, property damage, death and injury, and profound emotional suffering. What is also clear is that disaster risk is on the rise in the United States and around the world. At the same time, disasters reveal a great deal about the social world in which we live. Disasters peel back layers of complexity that normally obscure our vision of social relations. After a disaster occurs, we can see society for what it really is. Disasters therefore provide us with a unique opportunity to refine and reassess our ideas and assumptions about social life.	None	In-person	Main campus: Fall, Spring; TuTh



New Academic Program
PEER COMPARISON

Select three peers (if possible/applicable) for completing the comparison chart from [ABOR-approved institutions](#), [AAU members](#), and/or other relevant institutions recognized in the field. The comparison programs are not required to have the same degree type and/or title as the proposed UA program. Information for the proposed UA program must be consistent throughout the proposal documents. Minors and Certificates may opt to include only 2 peer comparisons.

Program name, degree, and institution	University of Arizona Future Earth Resilience	MIT Environment and Sustainability Minor	University of Minnesota Sustainability Studies Minor
Current number of students enrolled		23	161
Program Description	<p>Earth and humankind’s future relies upon sustaining healthy ecosystems, developing innovative interdisciplinary solutions, and centering perspectives of marginalized communities to equitably develop adaptation solutions for the betterment of all of Earth’s inhabitants. In this new minor program, we encourage students to go beyond traditional definitions of resilience by combining earth sciences with other disciplines. By incorporating diverse perspectives and methods, students will have the opportunity to engage in experiential, design-thinking approaches to develop innovative, sustainable solutions to support our planet’s life within the reality of our changing earth.</p> <p>Students will have the opportunity to explore resilience to answer the following guiding questions:</p>	<p>The Environment and Sustainability Minor (E&S Minor) offers students the opportunity to apply their STEM and major-course knowledge to some of the most Critical and challenging problems facing humanity. The minor equips students with interdisciplinary knowledge and real-world experience needed to understand, diagnose, and develop solutions to complex problems faced by society as it strives for social and environmental sustainability. Students tailor their MIT education to their professional goals, preparing to apply the principles of sustainability in diverse workplace contexts, including business/industry, government, civil society, and academia.</p> <p>The E&S Minor combines a wide range of fields of inquiry to directly engage environmental and climate challenges facing ecosystems and populations around the</p>	<p>The Sustainability Studies Minor immerses undergraduate students in the exploration of real-world problems from a variety of academic perspectives, incorporating disciplines from across the natural, social and applied sciences.</p> <p>The minor is a stand-alone, interdisciplinary minor rather than a major because of the breadth and wide-ranging applicability of the principles of sustainability. Students must earn at least 15 credits through five or more courses. The program is flexible, allowing students to petition for courses that are not listed to count towards the Minor, allowing study abroad to count for up to 6 credits and allowing courses that count towards students’ major or another minor to count towards the Sustainability Studies Minor.</p>

	<p>1. How can we explore the evolution of the relationship between earth processes and people? 2. <i>How can we design and implement resilient practices?</i> 3. How do we ensure that resilience is equitable?</p> <p>Students will be able to carry their chosen independent research topic thread from the introductory course throughout each of these courses. A required cumulative-experience capstone class will focus on translating concepts learned during the minor program with an emphasis on solution design, application, and understanding intended and unintended impacts.</p>	<p>globe. Fundamentally, these challenges affect both human systems and the earth systems on which we depend. Planetary challenges include climate change, risks to oceans and forests, degradation to both biodiversity and material resources, and fundamental transformations of biogeochemical cycles. Challenges facing society include widespread and intransigent environmental injustice, expanding urban and agricultural pollution, technological and economic lock-in of infrastructure and all manner of production and consumption systems, and a global dependence on carbon intensive energy.</p> <p>The minor prioritizes integrative, interdisciplinary learning that is critical for effectively understanding and addressing the complexities of environmental issues today and in the future, and is structured on four pillars: Earth Systems and Climate Science, Environmental Governance, Environmental Histories and Cultures, and Engineering for Sustainability. Upon completion of the minor, students will have achieved learning outcomes in seven categories: Systems Thinking; Sustainable Design; "Manus;" Know Your Planet; Social Context; Ethical Decision-making; and Impactful Communication.</p>	
Target Careers	<ul style="list-style-type: none"> - Government - Academia - Industry - NGOs/Non-profits 	<ul style="list-style-type: none"> - Business - Government - Academia - Civil society organizations 	<ul style="list-style-type: none"> - Government - Academia - Industry
Emphases? (Yes/No) List, if applicable	No	No	No
Minimum # of units required	18	57	15

Level of Math required (if applicable)	N/A	N/A	N/A
Level of Second Language required (if applicable)	N/A	N/A	N/A
Pre-Major? (Yes/No)	No	No	No
Special requirements to declare/gain admission?	<ul style="list-style-type: none"> - Meet with the Program Director - Complete Application - Entrance Survey - Exit Survey 	<ul style="list-style-type: none"> - Meet with Education Program Manager - Complete Application - Audit Forms - Exit Interview (to attain degree) 	<ul style="list-style-type: none"> - Good academic standing - Complete application
Minor requirements. List all minor requirements including core and electives. Courses listed must include course prefix, number, units, and title.	<p>Core</p> <p>RNR 388 (3) Biosphere 2 Science, From Wonder to Discovery</p> <p>(NEW, In-development) HNRS 4**: Future Earth Resilience Capstone</p> <p>Electives Complete 12 units from the following:</p> <p>AIS 426A (3) Principles of Indigenous Economics</p> <p>AIS/ANTH/ARL/ENV/S/RAM/ RNR/SWES/WSFC/WSM 441A (3) Natural Resource Management in Native Communities</p> <p>AIS/ANTH/ENV/S/GEOG/RAM/WFSC/W SM 431A (3) Traditional Ecological Knowledge</p> <p>ANTH 307 (3) Ecological Anthropology</p> <p>ANTH 438 (3) Women's Health in Global Perspective</p>	<p>Core Curriculum</p> <p>12.387[J] - People and the Planet: Environmental Governance and Science (9)</p> <p>One from the following (12 each):</p> <p>11.004[J] - People and the Planet: Environmental Histories and Engineering</p> <p>EC.701[J] - D-Lab: Development</p> <p>EC.715 - D-Lab: Water, Sanitation and Hygiene</p> <p>EC.719 - D-Lab: Water, Climate Change, and Health</p> <p>EC.720[J] - D-Lab: Design</p> <p>Select 36 units from the following:</p> <p>1.006 - Tools for Sustainable Design (12)</p> <p>1.08- Engineering Solutions to Societal Challenges (3)</p> <p>1.09- Climate Change (3)</p>	<p>Core Courses</p> <p>SUST 3003: Sustainable People, Sustainable Planet (3) SUST 4004:</p> <p>One from the following: ANTH 4053 – Economy, Culture, and Critique (3)</p> <p>ENGL 3501 – Public Discourse: Coming to Terms with the Environment (3)</p> <p>ESPM 3011W – Ethics in Natural Resources (3)</p> <p>GCC 3031 – The Global Climate Challenge: eating an Empowered Movement for Change (3)</p> <p>GEOG 3376 – Political Ecology of North America (3)</p> <p>GEOG 3379 – Environment and Development in the Third World (3)</p> <p>GLOS 3303 – Environment and Development in the Third World (3)</p> <p>GLOS/SOC 3613W – Stuffed and Starved: The Politics of Eating (3)</p>

	<p>ARC 461A (3) Water Efficiency in Buildings</p> <p>ATMO 336 (3) Weather, Climate and Society</p> <p>ATMO 436A (3) Fundamentals of the Atmospheric Sciences</p> <p>BE 482 (3) Integrated Engineered Solutions in the Food-Water-Energy Nexus</p> <p>CHEE 204 (3) Water and Energy: Conventional and Alternative Systems</p> <p>ECOL 206 (3) Environmental Biology</p> <p>ECOL 480 (3) Mathematical Models in Biology</p> <p>EHS 425 (3) A Public Health Lens to Climate Change</p> <p>EHS 426 (3) Topics in Environmental Justice</p> <p>EHS 489 (3) Public Health Preparedness</p> <p>ENGR/ENTR 420R (3) Innovation Principles and Environments</p> <p>ENVS 270 (3) Critical Zone Science</p> <p>ENVS 310 (3) Ecosystem Health and Justice</p> <p>ENVS/LAR/PLG 450 (3) Green Infrastructure</p>	<p>1.013- Senior Civil and Environmental Engineering Design (6)</p> <p>1.018[J]- Fundamentals of Ecology (12)</p> <p>1.020 - Engineering Sustainability: Analysis and Design (12)</p> <p>1.035 - Mechanics of Materials (12)</p> <p>1.061 - Transport Processes in the Environment (12)</p> <p>1.071[J] - Global Change Science (12)</p> <p>1.075 - Water Resource Systems (12)</p> <p>1.080 - Environmental Chemistry (12)</p> <p>1.085[J] - Air Pollution and Atmospheric Chemistry (12)</p> <p>1.089 - Earth's Microbiomes (12)</p> <p>1.91- Traveling Research Environmental eXperience (TREX): Fieldwork (3)</p> <p>1.92- Traveling Research Environmental eXperience (TREX): Fieldwork Analysis and Communication (9)</p> <p>1.102 - Introduction to Civil and Environmental Engineering Design II (6)</p> <p>1.107 - Environmental Chemistry Laboratory (6)</p> <p>2.00A - Fundamentals of Engineering Design: Explore Space, Sea and Earth (9)</p>	<p>GLOS/SOC 3613V – Honors: Stuffed and Starved: The Politics of Eating (3)</p> <p>GLOS 4311 – Power, Justice & the Environment (3)</p> <p>HSCI 3244 – Nature’s History: Science, Humans, and the Environment (3)</p> <p>HECU 3592 – Environmental Sustainability: Ecology and Socio-ecological Systems Change (4)</p> <p>PHIL 3301 – Environmental Ethics (4)</p> <p>SOC 4305 – Environment & Society: An Enduring Conflict (3)</p> <p>SOC 4311 – Power, Justice & the Environment (3)</p> <p>SUST 3017 – Environmental Justice (3)</p> <p>One from the following: APEC 3611W – Environmental and Natural Resource Economics (3)</p> <p>CEGE 5212 – Transportation Policy, Planning, and Deployment (3)</p> <p>ESPM 3241W – Natural Resource and Environmental Policy (3)</p> <p>ESPM 3245 – Sustainable Land Use Planning and Policy (3)</p> <p>ESPM 3251 – Natural Resources in Sustainable International Development (3)</p> <p>ESPM 3261 – Economics and Natural Resources Management (4)</p>
--	---	--	--

	<p>GEOG 230 (3) Our Dynamic Climate</p> <p>GEOG 240 (3) Our Dynamic Landscape</p> <p>GEOG 338 (3) Biogeography</p> <p>GEOG/AICS/EVS 374 (3) Geography, Social Justice and the Environment</p> <p>GEOG/EVS 302 (3) Introduction to Sustainable Development</p> <p>GEOG/EVS 304 (3) Water, Environment, and Society</p> <p>GEOG/EVS 363 (3) Climate Change: Human Causes, Social Consequences and Sustainable Responses</p> <p>GEOG/EVS 368 (3) The Green Economy</p> <p>GEOG/PLAN/PLG/PLN/PLNN/PLNG 379 (3) Urban Growth and Development</p> <p>GEOG/PLG/EVS/HWR/HWRS/LAS/PLAN/PLN/PLNG/PLNN/WRA 461 (3) Environmental and Resource Geography</p> <p>GEOS 212 (3) Introduction to Oceanography</p> <p>HWRS 203 (3) Arizona Water Issues</p> <p>HWRS 350 (3) Principles of Hydrology</p> <p>HWRS 443A (3) Risk Assessment for Environmental Systems</p> <p>NAFS 365 (3) The Food Economy - Efficiencies, Gaps and Policies</p>	<p>2.00C[J] - Design for Complex Environmental Issues: Building Solutions and Communicating Ideas (9)</p> <p>2.60[J] - Fundamentals of Advanced Energy Conversion (12)</p> <p>2.812 - Solving for Carbon Neutrality at MIT (12)</p> <p>2.813 - Energy, Materials, and Manufacturing (12)</p> <p>2.981 - New England Coastal Ecology (3)</p> <p>2.982 - Ecology and Sustainability of Coastal Ecosystems (9)</p> <p>3.081 - Industrial Ecology of Materials (12)</p> <p>3.094 - Materials in Human Experience (9)</p> <p>3.18- Materials Science and Engineering of Clean Energy (12)</p> <p>3.19- Sustainable Chemical Metallurgy (12)</p> <p>3.982 - The Ancient Andean World (9)</p> <p>3.983 - Ancient Mesoamerican Civilization (9)</p> <p>4.218 - Disaster Resilient Design (12)</p> <p>4.401 - Environmental Technologies in Buildings (12)</p> <p>4.432 - Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods (12)</p>	<p>ESPM 3602 – Regulations and Corporate Environmental Management (3)</p> <p>ESPM 3603 – Environmental Life Cycle Analysis (3)</p> <p>ESPM 3604 – Environmental Management Systems and Strategy (3)</p> <p>ESPM 4242 – Methods for Environmental and Natural Resource Policy Analysis (3)</p> <p>ESPM 5602 – Regulations and Corporate Environmental Management (3)</p> <p>GCC 3001 – Can We Feed the World Without Destroying It? (3)</p> <p>GCC 3011 – Pathways to Renewable Energy (3)</p> <p>GCC 5008 – Policy and Science of Global Environmental Change (3)</p> <p>PA 5232 – Transportation Policy, Planning, and Deployment (3)</p> <p>One from the following: AGRO 3203W – Environment, Global Food Production, and the Citizen (3)</p> <p>AGRO 5321 – Ecology of Agricultural Systems (3)</p> <p>ANSC 3203W – Environment, Global Food Production, and the Citizen (3)</p> <p>BIOL 1052 – Environmental Biology: Science and Solutions (3)</p> <p>BIOL 1055 – Environmental Biology: Science and Solutions with Laboratory (4)</p>
--	--	--	---

	<p>PA 482 (3) Environmental Governance</p> <p>PHIL/PA 323 (3) Environmental Ethics</p> <p>PLG 408 (3) Climate Action Planning</p> <p>PLG 473 (3) Transportation & Society</p> <p>PLG/GEOG/PLN/PLNN 497S (3) Sustainable Urban Development and Design</p> <p>RELI 360 (3) Religion, Nature, and Climate Change</p> <p>RELI 407 (3) Religion, Spirituality, and the Sacred in Native North America</p> <p>RNR 340 (3) Conservation and Agriculture in the Southwest</p> <p>RNR 440 (3) Climate Change Adaptation: Perspectives at the Nexus of Science, Society, & Resource Management</p> <p>RNR/LAR 448 (3) Conservation Planning & Wildland Recreation</p> <p>RNR 458 (3) Ecosystem Ecology and a Sustainable Future</p> <p>RNR/GEOG/GIST/SW/SWES 417 (3) Geographic Information Systems for Natural and Social Sciences</p> <p>RNR/PA 485 (3) The Economics & Social Connections to Natural Resources</p> <p>SIE 466 (3) Life Cycle Analysis for Sustainable Design and Engineering</p>	<p>4.657 - Design: The History of Making Things (12)</p> <p>8.21 - Physics of Energy (12)</p> <p>10.01 - Ethics for Engineers (6)</p> <p>10.04 - A Philosophical History of Energy (12)</p> <p>10.05 - Foundational Analyses of Problems in Energy and the Environment (12)</p> <p>11.002[J] - Making Public Policy (12)</p> <p>11.003[J] - Methods of Policy Analysis (12)</p> <p>11.007 - Urban and Environmental Technology Implementation Lab (12)</p> <p>11.011 - The Art and Science of Negotiation (12)</p> <p>11.113 - The Economic Approach to Cities and Environmental Sustainability (12)</p> <p>11.016[J] - The Once and Future City (12)</p> <p>11.123 - Big Plans and Mega-Urban Landscapes (9)</p> <p>11.142 - Geography of the Global Economy (12)</p> <p>11.148 - Environmental Justice: Law and Policy (12)</p> <p>11.158 - Behavioral Science and Urban Mobility (12)</p>	<p>CHEM 4601 – Green Chemistry (3)</p> <p>EEB 3001 – Ecology and Society (3)</p> <p>EEB 3407 – Ecology (3)</p> <p>EEB 3408W – Ecology (4)</p> <p>EEB 4609W – Ecosystem Ecology (3)</p> <p>ESCI 3005 – Earth Resources (3)</p> <p>ESCI 3402/5402 – Science and Politics of Global Warming (3)</p> <p>ESPM 3108 – Ecology of Managed Systems (3)</p> <p>FNRM 3101 – Park and Protected Area Tourism (3)</p> <p>FW 4102 – Principles of Conservation Biology (3)</p> <p>GEOG 1403 – Biogeography of the Global Garden (4)</p> <p>GEOG 3401 – Geography of Environmental Systems and Global Change (3)</p> <p>HECU 3591 – Environmental Sustainability: Sci, Public Policy, & Cmty Action Climate & Environment Justice (4)</p> <p>HORT 3131 – Student Organic Farm Planning, Growing, and Marketing (3)</p> <p>One of the following:</p> <p>ARCH 4561 – Architecture and Ecology (3)</p>
--	---	--	--

	<p>SOC/CHS 350 (3) Environment, Health, and Society</p> <p>SOC/CHS 405 (3) Disasters, Health & Society</p>	<p>11.165 - Urban Energy Systems and Policy (12)</p> <p>11.169 - Global Climate Policy and Sustainability (12)</p> <p>12.00- Solving Complex Problems (9)</p> <p>12.01- Introduction to Geology (12)</p> <p>12.02- Introduction to Geophysics and Planetary Science (12)</p> <p>12.03- Introduction to Atmosphere, Ocean, and Climate Dynamics (12)</p> <p>12.007 - Geobiology: History of Life on Earth (12)</p> <p>12.009[J] - Nonlinear Dynamics: The Natural Environment (12)</p>	<p>BBE 2201 – Renewable Energy and the Environment (3)</p> <p>BBE 4733 – Renewable Energy Technologies (3)</p> <p>CEGE 3501 – Introduction to Environmental Engineering (3)</p> <p>CEGE 4011 – Special Topics (1.0-4)</p> <p>CEGE 4561 – Solids and Hazardous Wastes (3)</p> <p>EE 1701 – Climate Crisis: Implementing Solutions (3)</p> <p>ESPM 3601 – Sustainable Housing–Community, Environment, and Technology (3)</p> <p>GCC 3005/5005 – Innovation for the Public Good: Design for a Disrupted World (3)</p> <p>GCC 5501 – Knowledge to Impact: eating Action with Your Grand Challenge Project Idea (3)</p> <p>LA 1001 – Sustainability by Design (3)</p> <p>LA 3003 – Climate Change Adaptation (3)</p> <p>LA 3004 – Regional Environmental Landscape Planning (4)</p> <p>LA 3501 – Environmental Design and Its Biological and Physical Context (3)</p> <p>LA 3514/5514 – Making the Mississippi (3)</p> <p>LA 4755 – Infrastructure, Natural Systems, and Space of Inhabited Landscapes (3)</p>
--	--	---	---

			PA 5743 – Social Innovation Design Lab: Making Your Idea a Reality (1.5)
Internship, practicum, or applied/experiential requirements?	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.
 - a. Overall, the themes for all three programs are similar in that they focus on resilience. Peer 1 focuses on climate change resilience and surrounding ethical questions, which we explore. The intended interdisciplinary audience of Peer 2 aligns with our intended audiences. Peer 2 and this program both try to incorporate natural sciences, social sciences, humanities, engineering, and beyond into our curriculum.

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.
 - a. This program is different than its peers because of its holistic concern about resilience and its goals to stretch traditional definitions of resilience. Peer 1 primarily focuses on climate change resilience. Peer 2 is more broad, but does not explore how non-environmentally focused sustainability and resilience are achieved. We are incorporating different topics, including environmental sustainability, climate change, public health, economy, social justice, and beyond, as all are needed to achieve equitable resilience. We believe that science and engineering are facets to achieve resilience, but more is needed to implement solutions. We have developed this program to explore how different solutions can help or harm a population. In this program, we explore that not all problems can be solved with an engineering innovation, especially not on its own, as culture, communication, and community play a role. Further, we are emphasizing non-Western ways to explore resilience and the world around us. Neither of these programs do this and very few (if any) explore resilience from these different types of perspectives, while trying to expand our understanding of how we understand the earth, its people, and resilience in these ways.

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?

- a. Student feedback of the existing Honors Minor (Health and Human Values) celebrated the minor and particularly noted its contribution to their University of Arizona journey. They cited its importance for their career development and sparked or renewed their passion. With this minor, we aim to provide additional programmatic opportunities focusing on sustainability and resilience, such that we can improve the student experience. Thus, we aim to improve enrollment, retention, and graduation rates of students in the Honors College. This program was designed to clearly detail the purpose of each requirement and overarching assignments (i.e., Contract and co-convened section template assignments). We can leverage the interdisciplinary nature of the Honors College to support the program goals to be an interdisciplinary experience to teach meaningful lessons rather than boxes to check to achieve a minor. The University of Arizona is particularly poised to address the interdisciplinary nature of resilience because of its designation as a land grant and Hispanic Serving Institution. With the diversity of these courses and faculty expertise across campus and disciplines we can strengthen connections and collaborations in the service of student success and scholarship.



BUDGET PROJECTION FORM

Name of Proposed Program or Unit: Future Earth Resilience Minor (Honors College)

Budget Contact Person: Iliana Fernandez (ifernandez1@email.arizona.edu)	Projected		
	1st Year 2022 - 2023	2nd Year 2023 - 2024	3rd Year 2024 - 2025
METRICS			
Net increase in annual college enrollment UG	15	30	45
Net increase in college SCH UG	45	90	135
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			
<u>Continuing Sources</u>			
UG RCM Revenue (net of cost allocation)	-	-	-
Grad RCM Revenue (net of cost allocation)	-	-	-
Program Fee RCM Revenue (net of cost allocation)	7,200	14,400	21,600
F and A Revenues (net of cost allocations)	-	-	-
UA Online Revenues	-	-	-
Distance Learning Revenues	-	-	-
Reallocation from existing College funds (attach description)	-	-	-
Other Items (attach description)	-	-	-
Total Continuing	\$ 7,200	\$ 14,400	\$ 21,600
<u>One-time Sources</u>			
College fund balances			
Institutional Strategic Investment			
Gift Funding			
Other Items (attach description)			
Total One-time	\$ -	\$ -	\$ -
TOTAL SOURCES	\$ 7,200	\$ 14,400	\$ 21,600
EXPENDITURE ITEMS			
<u>Continuing Expenditures</u>			
Faculty			
Other Personnel			
Employee Related Expense			
Graduate Assistantships			
Other Graduate Aid	-	-	-
Operations (materials, supplies, phones, etc.)			
Additional Space Cost	-	-	-
Other Items (attach description)	-	-	-
Total Continuing	\$ -	\$ -	\$ -
<u>One-time Expenditures</u>			
Construction or Renovation			
Start-up Equipment			
Replace Equipment			
Library Resources			
Other Items (attach description)			
Total One-time	\$ -	\$ -	\$ -
TOTAL EXPENDITURES	\$ -	\$ -	\$ -
Net Projected Fiscal Effect	\$ 7,200	\$ 14,400	\$ 21,600



THE UNIVERSITY OF ARIZONA
**W.A. Franke
Honors College**

John Pollard, Ph.D.
Associate Dean for Academics and
Curricular Innovation
W.A. Franke Honors College
Professor of Practice
Department of Chemistry and Biochemistry
Phone: (520) 626-2365
jpollard@arizona.edu

10/27/2021

RE: W.A. Franke Honors College minor, Future Earth Resilience

This letter is in support of the formation of a new and exciting interdisciplinary minor degree program within the W.A. Franke Honors College titled Future Earth Resilience. This new minor will be an amazing complement to our already existing minor called Health and Human Values and will be a great way for our amazing students to broaden the impact of their educational experiences at the University of Arizona. I fully support this minor as well as the creation of the currently in-development HNRS 4** course that is a component of the minor.

Regards,

John Pollard, Ph.D.

DONALD A. FALK
Professor

4 October 2021

Dear colleagues,

I am writing to express my full support for the proposed **Interdisciplinary Minor in Future Earth Resilience** being forwarded by The Honors College at UArizona in Partnership with Biosphere 2 and the Arizona Institutes for Resilience (AIR). This Minor will provide valuable opportunities for engaged student learning in what is arguably the critical issue of our time.

The structure of the Future Earth Resilience (FER) Minor revolves around three areas of knowledge and experience: (1) Earth systems and processes; (2) Sustainability through innovation; and (3) Developing equitable resilience. These areas of emphasis clearly echo the opening argument of the Minor: "Earth and humankind's future relies upon sustaining healthy ecosystems, designing innovative technologies, and center perspectives of marginalized communities to equitably develop adaptation solutions for the betterment all of Earth's inhabitants." I find these three areas well-articulated and appropriate.

In terms of courses to fulfill these three core areas, students have a wide range of classes from which to choose. Like most new Minors, the curriculum offerings to satisfy requirements have been drawn mostly from existing courses. I expect that over time, as this area of study increases in importance and visibility to students, new courses that are directly responsive to the areas of emphasis will become available which can be added. The inclusion of a capstone course is also a beneficial element of the curriculum progression, providing students with an opportunity to explore a topic of interest in greater depth.

The direct involvement of BioSphere 2 is a salient component to the proposed Minor. The in-residence introductory course at Bio2 offers a unique opportunity for students to coalesce as a group around core ideas and questions.

The University approved a related Minor in Climate Change and Society (CCS) within the past year. I find these two initiatives highly complementary, and not duplicative in any significant way. CCS is a University-wide program and intended explicitly to provide foundational competency in climate change and climate solutions for any student, regardless of major interest. FER is focused specifically on the Honors community, provides the unique offering of active engagement at Biosphere 2, and includes a capstone experience. We feel that there is more than enough room for these two complementary

Minors at a University with the size and diversity of UA.

I trust this letter provides a clear statement of support. If I can clarify any points or answer any additional questions, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. Falk', with a long horizontal flourish extending to the right.

Dr. Donald A Falk

Re: AIS Courses in the New Proposed Honors College Minor Program

Amy Fatzinger <fatzinge@email.arizona.edu>

Fri 17/09/2021 17:01

To: Gilbert, Matthew Sakiestewa - (sakiestewa) <sakiestewa@arizona.edu>

Cc: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>; Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>; Cruz, Christopher B - (cbcruz75) <cbcruz75@arizona.edu>; Carbajal, John R - (johncarbajal) <johncarbajal@arizona.edu>; Trospers, Ronald L - (rltrospers) <rltrospers@arizona.edu>

Hi, Caitlyn--

Thanks for getting in touch about this new Interdisciplinary Minor program. You're most welcome to include the two courses you listed among the options for the minor. Ron Trospers, our faculty member who teaches one of the courses you listed, suggested that you might also find AIS 426A (Principles of Indigenous Economics) a good fit for the minor; he'll follow up with you and share a syllabus.

With kind regards--

Amy

On Thu, Sep 9, 2021 at 1:54 PM Gilbert, Matthew Sakiestewa - (sakiestewa)

<sakiestewa@arizona.edu> wrote:

Hi Caitlyn,

Thank you for your email and interest in having two AIS courses count for your new interdisciplinary minor program. I am including the Chair of our Curriculum Committee, Amy Fatzinger, and Undergraduate Academic Advisor, Chris Cruz, to this email. We should have an answer for you very soon.

Thanks again!

Matt

Matthew Sakiestewa Gilbert
Professor and Head
Department of American Indian Studies
University of Arizona
Ofc: 520-626-9772

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Sent: Thursday, September 9, 2021 1:25 PM

To: Gilbert, Matthew Sakiestewa - (sakiestewa) <sakiestewa@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>

Subject: AIS Courses in the New Proposed Honors College Minor Program

Hello Professor Sakiestewa Gilbert,

My name is Caitlyn Hall and I'm a new faculty member with a joint appointment at the Honors College and Biosystems Engineering Department.

In my new role, I am working with John Pollard and Kevin Bonine to establish a new interdisciplinary minor program within the Honors College, *Future Earth Resilience*. In this proposed minor, students will explore what it takes to sustain a healthy biosphere, further environmental equity, and mitigate the effects of disasters by developing innovative solutions and diversifying our perspectives on what it means to be "resilient". In this new minor program, we encourage students to go beyond traditional boundaries of resilience and people's relationship with the planet.

We would like to include the following couple of courses from AIS to satisfy the minor requirements and hope to get your approval on their inclusion.

AIS/ANTH/ARL/ENVS/RAM/RNR/SWES/WSFC/WSM 441A	Natural Resource Management in Native Communities
AIS/ANTH/ENVS/GEOG/RAM/WFSC/WSM 431A	Traditional Ecological Knowledge

We would greatly appreciate any feedback on developing this minor with regards to AIS courses and beyond! Attached is a 3-page summary and a complete list of proposed courses.

Thank you so much for your time and help,

Caitlyn Hall

--

Amy S. Fatzinger, Ph.D.
Associate Professor, American Indian Studies
Director of Undergraduate Studies (AIS)
Affiliate, Department of English

University of Arizona
Harvill 235B // P.O. Box 210076
Tucson, AZ 85721-0076
520-621-8440
<http://www.ais.arizona.edu/>

September 24, 2021

Honors College
University of Arizona

To Whom it May Concern:

I am pleased to provide this letter of support from the School of Anthropology for the Honors College's new minor in *Future Earth Resilience*. Specifically, in support of this minor, the School of Anthropology will offer **ANTH 307 Ecological Anthropology** and **ANTH 438 Women's Health in Global Perspective** on a regular basis. We do not anticipate any problems having seats available for Honors Program students in these courses.

Please do not hesitate to contact me if you have any questions.

Sincerely yours,




Diane E. Austin
Professor and Director





memorandum

to **Caitlyn Hall, Ph.D., Assistant Professor of Practice**
Honors College
from Robert Miller, Professor, Director
School of Architecture
re interdisciplinary minor program, Honors College, *Future Earth Resilience*
action SUPPORT FROM SCHOOL OF ARCHITECTURE
copy Laura Hollengreen, Associate Dean for Academic Affairs
page 1 of 3



This is to offer support for the proposed interdisciplinary minor program within the Honors College, *Future Earth Resilience*. Toward this end we are happy to offer our ARC 461a | Water Efficiency in Buildings taught by Assistant Professor Courtney Crosson.

ARC 461a is offered with a co-convened graduate course, ARC 561a, of the same name and topic. When we co-convene in this manner, we put honors students with the graduate students in terms of expectations and often provide an occasional seminar or other component for the honors and graduate students.

This course has a capacity of about 24 students. It usually has about a dozen students, so has an available capacity of about 10-16 students.

Currently, this course is taught once/year; however, Professor Crosson is eligible for sabbatical in AY 2022-2023 and it is likely that we will not offer this course if she is away.

end of memorandum

If this MEMO contains information that does not accurately reflect your understanding, please advise sender in writing.

Re: BE Courses in Future Earth Resilience Minor

Farrell-Poe, Kathryn L - (kittfp) <kittfp@arizona.edu>

Thu 09/09/2021 15:27

To: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>

Nice work Caitlyn et al.! And yes, BE approves of having BE 482 included as part of the suite of classes for the Sustainability Through Innovation emphasis area. Thank you for including us in your planning efforts.

Kitt

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Sent: Thursday, September 9, 2021 2:14 PM

To: Farrell-Poe, Kathryn L - (kittfp) <kittfp@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>

Subject: BE Courses in Future Earth Resilience Minor

Hi Kitt,

Kevin, John, and I are starting to finalize the courses to include in the initial iteration of the Future Earth Resilience honors minor. We are hoping to include the following course and are hoping for your approval!

BE 482	Integrated Engineered Solutions in the Food-Water-Energy Nexus
--------	--

Attached is a 3-page summary of the proposal with the complete list of suggested courses.

Thank you!

Caitlyn

RE: CHEE Courses in the New Honors College Minor Program

Ogden, Kimberly L - (ogden) <ogden@arizona.edu>

Wed 15/09/2021 12:48

To: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>

Absolutely

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>
Sent: Wednesday, September 15, 2021 12:27 PM
To: Ogden, Kimberly L - (ogden) <ogden@arizona.edu>
Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>
Subject: RE: CHEE Courses in the New Honors College Minor Program

Hello,

I just wanted to follow up on this - After reviewing the pre-requisites, we'd like to continue forward with just CHEE 204. So, I just wanted to make sure that we have your approval to include it in our list!

Thank you!
Caitlyn

From: Ogden, Kimberly L - (ogden) <ogden@arizona.edu>
Sent: Thursday, September 9, 2021 4:29 PM
To: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>
Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>
Subject: RE: CHEE Courses in the New Honors College Minor Program

I will find out

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>
Sent: Thursday, September 9, 2021 3:59 PM
To: Ogden, Kimberly L - (ogden) <ogden@arizona.edu>
Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>
Subject: Re: CHEE Courses in the New Honors College Minor Program

Hello,

Thanks for your feedback. Who would you recommend I reach out to to ask about 302?

We selected these courses because nearly all have no pre-reqs.

Thank you!
Caitlyn

Get [Outlook for Android](#)

From: Ogden, Kimberly L - (ogden) <ogden@arizona.edu>
Sent: Thursday, September 9, 2021, 3:53 PM

To: Hall, Caitlyn Anne - (cahall)
Cc: Bonine, Kevin E - (kebonine); Pollard, John R - (jpollard)
Subject: RE: CHEE Courses in the New Honors College Minor Program

I am fine with CHEE 204. I would have to check if 302 is still a thing. My only issue is that there are a lot of options, maybe too many. Will students have all of the pre-reqs?

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>
Sent: Thursday, September 9, 2021 2:16 PM
To: Ogden, Kimberly L - (ogden) <ogden@arizona.edu>
Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>
Subject: CHEE Courses in the New Honors College Minor Program

Hello Professor Ogden,

My name is Caitlyn Hall and I'm a new faculty member with a joint appointment at the Honors College and Biosystems Engineering Department.

In my new role, I am working with John Pollard and Kevin Bonine to establish a new interdisciplinary minor program within the Honors College, *Future Earth Resilience*. In this proposed minor, students will explore what it takes to sustain a healthy biosphere, further environmental equity, and mitigate the effects of disasters by developing innovative solutions and diversifying our perspectives on what it means to be "resilient". In this new minor program, we encourage students to go beyond traditional boundaries of resilience and people's relationship with the planet.

We would like to include the following courses from CHEE to satisfy the minor requirements and hope to get your approval on their inclusion. Please let me know if I have left anyone out of the conversation that should be included for departmental approval!

CHEE 204	Water and Energy: Conventional and Alternative Systems
CHEE 302	Carbon Audits and Sustainability

We would greatly appreciate any feedback on developing this minor with regards to CHEE courses and beyond! Attached is a 3-page summary and a complete list of proposed courses.

Thank you so much for your time and help,
Caitlyn Hall

Date: September 30, 2021

To: Caitlyn Hall, Assistant Professor of Practice, Honors College & Biosystems Engineering

From: Jeremiah Hackett, Interim Department Head, Ecology and Evolutionary Biology

Re: Support for Inclusion of ECOL Courses in Future Earth Resilience Minor

Dear Caitlyn,

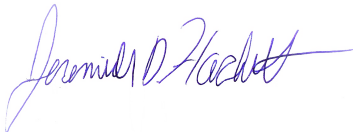
The following ECOL courses are permitted to be included as elective options to satisfy the minor requirements of the proposed Future Earth Resilience program:

ECOL 206 Environmental Biology (offered Spring and Summer, fully-online)

ECOL 480 Mathematical Models in Biology (offered Spring, in-person)

We anticipate that our Department will be able to support the enrollment of Future Earth Resilience minors in the courses listed above, and that the SCH revenue generated from this enrollment will cover our cost of delivery.

Sincerely,



Dr. Jeremiah Hackett
Interim Department Head
Ecology and Evolutionary Biology



RE: EHS Courses in the New Honors College Minor Program

Reynolds, Kelly A - (reynolds) <reynolds@arizona.edu>

Mon 13/09/2021 13:53

To: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>; Kilungo, Aminata P - (paminata) <paminata@arizona.edu>

Cc: Ehiri, John E - (jehiri) <jehiri@arizona.edu>

Hello Caitlyn,

Welcome to your new position at the University of Arizona. Thank you for including the EHS courses listed below as part of the elective options for the interdisciplinary minor, Future Earth Resilience.

I approve the use of these courses and have added Dr. John Ehiri to this email who is or Associate Dean for Academic Affairs so he can also be aware of the development.

Best,

Kelly

Kelly A. Reynolds, PhD
Professor & Chair, Community, Environment and Policy
Director, Environment, Exposure Science and Risk Assessment Center (ESRAC)
Director, Western Region Public Health Training Center (WRPHTC)
Zuckerman College of Public Health
The University of Arizona

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Sent: Thursday, September 9, 2021 2:18 PM

To: Reynolds, Kelly A - (reynolds) <reynolds@arizona.edu>; Kilungo, Aminata P - (paminata) <paminata@arizona.edu>

Subject: EHS Courses in the New Honors College Minor Program

Hello Professors Reynolds and Kilungo,

My name is Caitlyn Hall and I'm a new faculty member with a joint appointment at the Honors College and Biosystems Engineering Department.

In my new role, I am working with John Pollard and Kevin Bonine to establish a new interdisciplinary minor program within the Honors College, *Future Earth Resilience*. In this proposed minor, students will explore what it takes to sustain a healthy biosphere, further environmental equity, and mitigate the effects of disasters by developing innovative solutions and diversifying our perspectives on what it means to be "resilient". In this new minor program, we encourage students to go beyond traditional boundaries of resilience and people's relationship with the planet.

We would like to include the following courses from EHS to satisfy the minor requirements and hope to get your approval on their inclusion. Please let me know if I have left anyone out of the conversation that should be included for departmental approval!

EHS 425	A Public Health Lens to Climate Change
EHS 426	Topics in Environmental Justice
EHS 489	Public Health Preparedness

We would greatly appreciate any feedback on developing this minor with regards to EHS courses and beyond!
Attached is a 3-page summary and a complete list of proposed courses.

Thank you so much for your time and help,
Caitlyn Hall

RE: Action Requested: ENGR Courses in the New Honors College Minor Program

Baygents, James C - (baygents) <baygents@arizona.edu>

Fri 17/09/2021 12:48

To: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>; Farrell-Poe, Kathryn L - (kittfp) <kittfp@arizona.edu>; Lansey, Kevin E - (lansey) <lansey@arizona.edu>; White, Jocelyn - (jdwhite) <jdwhite@arizona.edu>

Hi, Caitlyn.

No problem on our end. Please proceed.

Jim.

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Sent: Thursday, September 16, 2021 11:33 AM

To: Baygents, James C - (baygents) <baygents@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>; Farrell-Poe, Kathryn L - (kittfp) <kittfp@arizona.edu>

Subject: Action Requested: ENGR Courses in the New Honors College Minor Program

Hi Jim,

Just following up on this. We're hoping to send this in for review by the end of next week and want to finalize our course list and hope to include these excellent courses!

Please let me know if I have left anyone out of the conversation that should be included for departmental approval!

From: Hall, Caitlyn Anne - (cahall)

Sent: Thursday, September 9, 2021 2:30 PM

To: Baygents, James C - (baygents) <baygents@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>

Subject: ENGR Courses in the New Honors College Minor Program

Hello Jim,

I am working with John Pollard and Kevin Bonine to establish a new interdisciplinary minor program within the Honors College, *Future Earth Resilience*. In this proposed minor, students will explore what it takes to sustain a healthy biosphere, further environmental equity, and mitigate the effects of disasters by developing innovative solutions and diversifying our perspectives on what it means to be "resilient". In this new minor program, we encourage students to go beyond traditional boundaries of resilience and people's relationship with the planet.

We would like to include the following courses from ENGR to satisfy the minor requirements and hope to get your approval on their inclusion. Please let me know if I have left anyone out of the conversation that should be included for departmental approval!

ENGR/ENTR 420R	Innovation Principles and Environments
ENGR 495A	Science, Health and Engineering Policy and Diplomacy

We would greatly appreciate any feedback on developing this minor with regards to ENGR courses and beyond! Attached is a 3-page summary and a complete list of proposed courses.

Thank you so much for your time and help,
Caitlyn Hall



MEMORANDUM

DATE: September 30, 2021

TO: Caitlyn Hall, Ph.D., Honors College and Department of Biosystems Engineering

FROM: Jon Chorover
Professor and Department Head

RE: Use of ENVS courses in Future Earth Resilience Minor

I am writing to express my support for the newly proposed *Future Earth Resilience* minor by the Honors College.

I approve the inclusion of the following course within the minor:

ENVS 270	Critical Zone Science
ENVS 310	Ecosystem Health and Justice
ENVS/LAR/PLG 450	Green Infrastructure

The courses involved in the minor are regularly offered as part of our existing curriculum and seats are available in this course.

I foresee no conflicts in curriculum or related matters within my department with the establishment of this minor.





THE UNIVERSITY OF ARIZONA
COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES
**School of Geography,
Development &
Environment**

ENR2 Building, South 4th Floor
PO Box 210137
Tucson, Arizona 85721-0137
Ofc: 520-621-1652
Fax: 520-621-2889
geography.arizona.edu

September 23, 2021

Caitlyn Hall, Ph.D.
Assistant Professor of Practice
Honors College

Dear Dr. Hall:

Many thanks for including SGDE in the planning for the new Honors minor in Future Earth Resilience. We are happy for you to include our Geography (GEOG) and Environmental Studies (EVS) courses in the new minor, as listed in the table below, and indeed we are enthusiastic for you to do so.

GEOG 230	Our Changing Climate
GEOG 240	Our Dynamic Landscape
GEOG 338	Biogeography
GEOG/EVS 304	Water, Environment, and Society
GEOG/PLG/EVS/HWR/HWRS/LAS/ PLAN/PLN/PLNG/PLNN/WRA 461	Environmental and Resource Geography
GEOG/EVS 302	Introduction to Sustainable Development
GEOG/PLAN/PLG/PLN/PLNN/ PLNG 379	Urban Growth and Development
GEOG/AICS/EVS 374	Geography, Social Justice and the Environment
GEOG/EVS 363	Climate Change: Human Causes, Social Consequences and Sustainable Responses
GEOG/EVS 368	The Green Economy

We regularly offer these courses and we will have seats available for students to take the courses. I wish you all the best with launching the new minor.

Sincerely,

Andrew C. Comrie, Ph.D.
Professor & Director



Dr. Barbara Carrapa
Professor and Department Head
Department of Geosciences
Gould-Simpson Building
Tucson, AZ 85721-0077



Tel. (520) 621 5011
Fax (520) 621 2672

Tucson, September 23, 2021

To whom this may concern,

This letter is in support of the new interdisciplinary minor program, *Future Earth Resilience*, within the Honors College at the University of Arizona. The Department of Geosciences approves the use of GEOS 212, Introduction to Oceanography, as a required class for this minor. We confirm that Geosciences has regular offerings and seats available for the students in the *Future Earth Resilience* minor.

Sincerely,

A handwritten signature in black ink that reads "Barbara Carrapa". The signature is written in a cursive style with a large initial 'B'.

Barbara Carrapa
Professor and Department Head, Geosciences

September 24, 2021

Caitlyn Hall, Ph.D.
University of Arizona
Assistant Professor of Practice
Honors College
Biosystems Engineering

Dear Caitlyn:

This is an official letter of support for the inclusion of the following Hydrology & Atmospheric Sciences courses in the Honors Minor. I can confirm that these classes have regular offerings and seats available to accommodate Honors students who seek to pursue the Honors minor:

1. ATMO 336 *Weather, Climate and Society* (3 units)
2. ATMO 436A *Fundamentals of the Atmospheric Sciences* (3 units)
3. HWRS 203 *Arizona Water Issues* (3 units)
4. HWRS 350 *Principles of Hydrology* (3 units)
5. HWRS 443A *Risk Assessment for Environmental Systems* (3 units)

With very best regards,



fa

Thomas Meixner, Ph.D.
Department Head
tmeixner@arizona.edu (520) 621-7121

September 24, 2021

Biosystems Engineering
Campus

Dear Dr. Hall,

We would be happy to include AREC/NAFS 365 *The Food Economy - Efficiencies, Gaps and Policies* as one of the requirements for you proposed interdisciplinary minor program within the Honors College, *Future Earth Resilience*. There should be an adequate number of seats in the class to accommodate any Honors students.

We wish you success in launching and growing your new interdisciplinary minor.

Sincerely,



Gary Thompson
Professor and Department Head
Department of Agricultural and Resource Economics
College of Agriculture & Life Sciences
The University of Arizona
McClelland Park 304C
650 N. Park Avenue
Tucson, AZ 85719-0078





COLLEGE OF SOCIAL AND BEHAVIORAL SCIENCES

School of Government
and Public Policy

School of Government & Public Policy
315 Social Science
P.O. Box 210027
Tucson, AZ 85721-0027
Tel: (520) 621-7600
Fax: (520) 621-5051
<http://sgpp.arizona.edu>

October 12, 2021

To Whom it May Concern:

We support adding PA 482, Environmental Governance, to the new Future Earth Resilience minor.

This course is offered regularly, typically once per year in the fall semester. Our advisors have confirmed that there are seats available in this course. We believe the new minor will be well received by students.

Sincerely,

A handwritten signature in black ink that reads "Edella Schlager". The signature is written in a cursive style and is centered within a light gray rectangular box.

Edella Schlager
Director
The Melody S. Robidoux Foundation Fund Leadership Chair





THE UNIVERSITY OF ARIZONA
COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES
Philosophy

**DEPARTMENT OF
PHILOSOPHY**

Social Sciences, Room 213

1145 E. South Campus Dr.

University of Arizona

Tucson, Arizona 85721

520-621-5045

<https://philosophy.arizona.edu/>

1 October 2022

To whom it may concern,

This letter is to confirm the support of the philosophy department for including PHIL 323 – Environmental Ethics in the proposed Future Earth Resilience minor. We offer this course regularly and anticipate no difficulties in accommodating additional students.

Sincerely,

Jason Turner
Head, Department of Philosophy
The University of Arizona



THE UNIVERSITY OF ARIZONA

College of Architecture, Planning
& Landscape Architecture

SCHOOL OF LANDSCAPE ARCHITECTURE & PLANNING | 520-621-1004 | capla@arizona.edu

September 24, 2021

To Whom it May Concern:

I support the Honors College's inclusion of the following courses in the proposed minor program: "Future Earth Resilience." These courses are offered regularly and seats will be available for students in the minor.

- PLG 408 Climate Action Planning
- PLG 473 Transportation & Society
- PLG 497S Sustainable Urban Development & Design

Sincerely,

Lauri Macmillan Johnson, Director and Professor
School of Landscape Architecture and Planning

**DEPARTMENT OF
RELIGIOUS STUDIES & CLASSICS**

Learning Services Building
Room 203
1512 E. First Street
PO Box 210105
Tucson, Arizona 85721-0105

Tel: (520) 621-1689
Fax: (520) 621-3678

www.religion.arizona.edu
www.classics.arizona.edu



September 28, 2021

Dr. Terry L. Hunt, Dean
Honors College
The University of Arizona
1101 East Mabel Street
Tucson, AZ 85719

Dear Dr. Hunt:

In my role as Head of Department of Religious Studies and Classics at the University of Arizona, I am writing in support of the Honors College's proposal for a new minor, *Future Earth Resilience*.

I am also writing to give approval for the following courses to be listed as electives for this minor: **RELI 360 - Religion, Nature, and Climate Change** and **RELI/AIS 407 - Religion, Spirituality, and the Sacred in Native North America**. These courses are housed within the Department of Religious Studies and Classics and the department offers these courses regularly. These courses are able to accommodate the anticipated enrollment generated from this new minor.

Sincerely,



Karen K. Seat
Head, Department of Religious Studies and Classics
Director, School of International Languages, Literatures, and Cultures (SILLC)



RE: RNR and WFSC Courses in the New Honors College Minor Program

van Leeuwen, Willem J - (leeuw) <leeuw@arizona.edu>

Fri 24/09/2021 15:00

To: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>; Hughes, Katie Marie - (khughes) <khughes@arizona.edu>; Falk, Donald A - (dafalk) <dafalk@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>; Steidl, Robert J - (steidl) <steidl@arizona.edu>; Gallery, Rachel Elizabeth - (rgallery) <rgallery@arizona.edu>

Good afternoon Caitlyn et al:

If everyone is on board with this, I will be happy to support the inclusion of the following RNR and WFSC Courses in the New Honors College Minor Program:

RNR 388 BIOSPHERE 2 SCIENCE, FROM WONDER TO DISCOVERY

RNR 458 Ecosystem Ecology and a Sustainable Future

RNR 440: Climate Change Adaptation: Perspectives at the Nexus of Science, Society, & Resource Management

RNR 340 Conservation and Agriculture in the Southwest

RNR 448 Conservation Planning and Wildland Recreation

RNR 417 GIS for Natural and Social Sciences

RNR 485 Natural Resource Management and Economics

Best, Wim

Willem J.D. van Leeuwen, Professor and Interim Director
School of Natural Resources and the Environment
Professor School of Geography, Development & Environment
Director Arizona Remote Sensing Center

ENR2 Bldg. N333
1064 E. Lowell Street
The University of Arizona
Tucson, AZ 85721

Phone: 520 626-0058 Fax: 520 621-8801
e-mail: leeuw@email.arizona.edu
<http://snre.arizona.edu/people/willem-van-leeuwen>
<https://ARSC.Projects.story.maps/>
<https://droughtview.arizona.edu/>
<https://snowview.arizona.edu/>
<http://snre.arizona.edu/facilities/arsc>

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>
Sent: Thursday, September 23, 2021 6:26 PM
To: Hughes, Katie Marie - (khughes) <khughes@arizona.edu>; Falk, Donald A - (dafalk) <dafalk@arizona.edu>
Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>; Steidl, Robert J - (steidl) <steidl@arizona.edu>; Gallery, Rachel Elizabeth - (rgallery) <rgallery@arizona.edu>; van Leeuwen, Willem J - (leeuw) <leeuw@arizona.edu>
Subject: Re: RNR and WFSC Courses in the New Honors College Minor Program

Hi all,

Sorry, it occurred to me that I missed RNR 388 in the list.

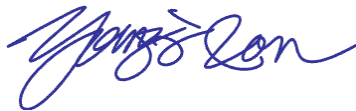
September 23, 2021

Caitlyn Hall, Ph.D.
Assistant Professor of Practice
Honors College
Biosystems Engineering

Dear Dr. Hall:

Thank you for your recent message concerning the development of a new interdisciplinary minor program within the Honors College, *Future Earth Resilience*. As a home department for SIE 466 (Life Cycle Analysis for Sustainable Design and Engineering) that is included in the curriculum listing for the minor, this letter serves to confirm that SIE 466 is regularly offered (viz. once per year) and seats are available in the class.

Sincerely,



Young-Jun Son, Ph.D.
Professor and Head of Department of Systems and Industrial Engineering

RE: SOC Courses in the New Honors College Minor Program

Mayer, Brian M - (brianmayer) <brianmayer@arizona.edu>

Thu 16/09/2021 08:37

To: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>; Leahey, Erin E - (leahey) <leahey@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>

Hi Caitlyn,

This sounds like an amazing program. I hope to get a chance to meet you in the near future – I've had an opportunity to interact some with both Kevin and John in the past. Both of these courses are actually my design as well. One of my main areas of research is on community resilience to environmental change and disasters.

We're happy to have both of the courses support your new minor proposal.

I might also offer the idea of including an additional course that I teach – SOC/CHS 497a Healthy Community Design and Innovation. It's an applied field course that combines a human-centered design approach to community health interventions, all with a grounding in the community resilience literature.

Please let me know how I can help moving forward,
Brian

--

Brian Mayer, PhD
Professor, Director of Undergraduate Studies
School of Sociology
College of Social and Behavioral Sciences
520.626.2190
brianmayer@email.arizona.edu

Pronouns: he, him, his



Tucson and the UA are located on Tohono O'odham Nation homelands and the lands of the Pascua Yaqui Tribe.

From: Hall, Caitlyn Anne - (cahall) <cahall@arizona.edu>

Sent: Tuesday, September 14, 2021 2:54 PM

To: Leahey, Erin E - (leahey) <leahey@arizona.edu>; Mayer, Brian M - (brianmayer) <brianmayer@arizona.edu>

Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>

Subject: RE: SOC Courses in the New Honors College Minor Program

Hello Professors Leahey and Mayer,

I just wanted to follow-up on this to start finalizing a list of courses to propose for the minor and we very much hope to include courses from the Sociology department!

My name is Caitlyn Hall and I'm a new faculty member with a joint appointment at the Honors College and Biosystems Engineering Department.

In my new role, I am working with John Pollard and Kevin Bonine to establish a new interdisciplinary minor program within the Honors College, *Future Earth Resilience*. In this proposed minor, students will explore what it takes to sustain a healthy biosphere, further environmental equity, and mitigate the effects of disasters by developing innovative solutions and diversifying our perspectives on what it means to be “resilient”. In this new minor program, we encourage students to go beyond traditional boundaries of resilience and people’s relationship with the planet.

We would like to include the following courses from SOC to satisfy the minor requirements and hope to get your approval on their inclusion. Please let me know if I have left anyone out of the conversation that should be included for departmental approval!

SOC/CHS 350	Environment, Health, and Society
SOC/CHS 405	Disasters, Health & Society

We would greatly appreciate any feedback on developing this minor with regards to SOC courses and beyond! Attached is a 3-page summary and a complete list of proposed courses.

Thank you so much for your time and help,
Caitlyn Hall

From: Hall, Caitlyn Anne - (cahall)
Sent: Thursday, September 9, 2021 2:28 PM
To: leahey@arizona.edu; brianmayer@email.arizona.edu
Cc: Bonine, Kevin E - (kebonine) <kebonine@arizona.edu>; Pollard, John R - (jpollard) <jpollard@arizona.edu>
Subject: SOC Courses in the New Honors College Minor Program

Hello Professors Leahey and Mayer,

My name is Caitlyn Hall and I’m a new faculty member with a joint appointment at the Honors College and Biosystems Engineering Department.

In my new role, I am working with John Pollard and Kevin Bonine to establish a new interdisciplinary minor program within the Honors College, *Future Earth Resilience*. In this proposed minor, students will explore what it takes to sustain a healthy biosphere, further environmental equity, and mitigate the effects of disasters by developing innovative solutions and diversifying our perspectives on what it means to be “resilient”. In this new minor program, we encourage students to go beyond traditional boundaries of resilience and people’s relationship with the planet.

We would like to include the following courses from SOC to satisfy the minor requirements and hope to get your approval on their inclusion. Please let me know if I have left anyone out of the conversation that should be included for departmental approval!

SOC/CHS 350	Environment, Health, and Society
SOC/CHS 405	Disasters, Health & Society

We would greatly appreciate any feedback on developing this minor with regards to SOC courses and beyond! Attached is a 3-page summary and a complete list of proposed courses.

Thank you so much for your time and help,
Caitlyn Hall

498A: Future Earth Resilience Minor Capstone

New Description: In this course, students will translate their experiences during the Future Earth Resilience (FER) minor to designing and implementing action-oriented solutions. In this course, we will explore how research and academic knowledge can be translated to develop initiatives for change built on students' experiences throughout the FER program. This course is broken into three parts to engage with resilience and the United Nations Sustainable Development Goals through reflection, synthesis, action.

Major Assignments:

1. FER Reflection

In RNR 388, students will be given an assignment that asks them to identify an exploration topic thread related to the United Nations' Sustainable Development Goals that they will have carried throughout the program. They will be guided to scope their exploration throughout the course by location (e.g., water issues at the Arizona-Mexico border) or issue type (e.g., the impact of mining activities on water quality). During each of the electives, students will have completed an assignment that guides their exploration of this topic thread through the lens of their elective class. Once they reach the capstone, these assignments will be turned back to them and they will be asked to reflect on how their perceptions of their topic thread have changed since the beginning of the program. If students decided to pivot during the program to a different topic thread, they will be asked to reflect on why. Students will also reflect on their perceptions and understanding of the complex and interdisciplinary nature of resilience, including stakeholder needs and values, historical and contemporary contexts, scientific application, and intended and un-intended impacts. This gives students the opportunity to thoughtfully grapple with what they've learned and how they've grown, including considering what impact this growth has had on their future plans.

2. Individual Case Study

At the end of the FER Reflection assignment, students will scope their topic thread even further to research a Case Study issue that considers their chosen topic. In this Case Study, students will propose a solution that addresses the issue. They will be asked to articulate details of the solution, justify their proposed solution, and outline how it could be implemented. The solution justification will be required to be sourced to explain why this could solve their concern by referring to completed research or similar case studies that were successful, as well as why this solution could be applied considering community values. Students will outline expected stakeholders, including who will benefit and who may be harmed, and explicitly address equity.

3. Local Group Civic Engagement Project

Students will form groups to identify a resilience issue in Arizona to engage with through civic engagement. Students will translate research and existing resources to public-facing materials (e.g., social media posts, one-pagers). Students will connect with local decision-makers to engage in their chosen issue. Each group will reflect on their experiences, revise their

public-facing materials to develop awareness toolkits aimed to reduce barriers and encourage others to engage with decision-makers.