



# NSF-NRT Indige-FEWSS

## Trainee Duties & Responsibilities

### General

- Once a Trainee, always a Trainee! From acceptance into the NSF-NRT program until a Trainee has completed the degree, Indige-FEWSS faculty and staff will support your research efforts and provide opportunities for your professional development.
- Trainees are ambassadors of University of Arizona. As such, trainees are expected to comport themselves in accordance with professional and cultural standards while at the university, internship sites, conferences, and Navajo Nation.
- Trainees should not be employed either inside or outside of the University during their funded fellowship. Per NRT rules, a Trainee must place any other fellowship, assistantship or monetary award on reserve status during the period of NSF-NRT funding.
- Trainees are expected to meet all deadlines for coursework, projects and information gathering (i.e., evaluation) activities. When delays are unavoidable, trainees are expected to notify the program coordinator and their faculty advisor and to negotiate a new deadline.
- Trainees must complete all University of Arizona safety trainings and new student orientation requirements as directed.
- Trainees must participate in the Indige-FEWSS orientation prior to the start of their first semester as a trainee.
- Trainees must live in Tucson, Arizona during the academic year and participate in their graduate program in person; distance and online graduate degree programs do not allow Trainees to participate fully.
- Trainees must maintain good academic standing in their home department and in the UA Graduate College to continue in the NRT program.
- Trainees will complete and deliver assessment instruments and/or participate in interviews and focus groups as part of project evaluation. Stipend disbursements depend upon completion of specified requests.
- Trainees will give a talk or seminar on their Indige-FEWSS-related research at University of Arizona meetings/seminars, at professional conferences, and/or to other cohort members, as requested.
- Training Component: Major Coursework; I-FEWS Minor; Research; Pilot Project; Professional Development via ENVS696 and training opportunities on and off campus; Internship; Cultural Immersion. Trainees must engage in each component of this comprehensive program.
- Trainees will contribute 20 work hours each week to the Indige-FEWSS program, to encompass research, coursework, contributions to the pilot project, field trips and conference travel, presentations, science communication development and professional development activities.
- See below and website for general timeline of MS and PhD Traineeship track.

### Coursework

- Major Coursework: Trainees must complete all the requirements of their home department and degree program(s).
- Trainees are required to enroll in **ENVS 696N** (a one-credit seminar class held weekly) for both Fall and Spring semesters and to complete all seminar assignments. This seminar will encompass training in research, professional development and cultural immersion topics, among others. After the first year of participation, Trainees will be required to attend the monthly Indige-FEWSS professional seminar series.

- Trainees will be invited to attend seminars, field trips and other extra-curricular activities throughout the program.
- FEWS Minor: Master’s level Trainees agree to complete two of the FEWS Minor courses, regardless of funding status. MS trainees take one Systems and one American Indian Studies course.
- FEWS Minor: PhD level Trainees are required to take four of the FEWS Minor courses, regardless of funding status.
- See below and website for list of FEWS Minor coursework.

## **Research**

- Trainees are required to complete the Responsible Conduct of Research (RCR) program within one year of starting the traineeship, and must begin this certification within 30 days of starting with Indige-FEWSS.
- Trainees are expected to create a portfolio of FEWS-related projects.
- Trainees are required to focus their thesis or dissertation project on a FEWS-related question under the supervision of their core faculty advisor.
- Pilot Project: Trainees will create, along with their Indige-FEWSS advisor and cohort and project faculty, a pilot project to address a real-world FEWS challenge on Navajo Nation.
- Trainees will give a talk and/or seminar on their FEWS-related research to other cohort members.
- See below and website for Indige-FEWSS research theme and goals.

## **Cultural Immersion & Professional Development**

- Professional Development: MS and PhD Trainees will complete a FEWS-related internship after their first academic year in the program.
- PhD level Trainees will complete a teaching and immersion experience in Navajo Nation after their second academic year in the program. (Master’s level Trainees are invited to participate.)
- Trainees agree to attend workshops, conferences and organizational events pertaining to Indigenous topics, FEWS issues and NRT programming.
- FEWS science communication club: Trainees will participate in a self-directed meeting every other week to develop writing and presentation skills focused on FEWS journal articles, FEWS case studies, and Trainees’ own research projects.
- NSF-NRT funding and/or additional grant funding is available to cover most project-related travel expenses, regardless of Traineeship funding status.

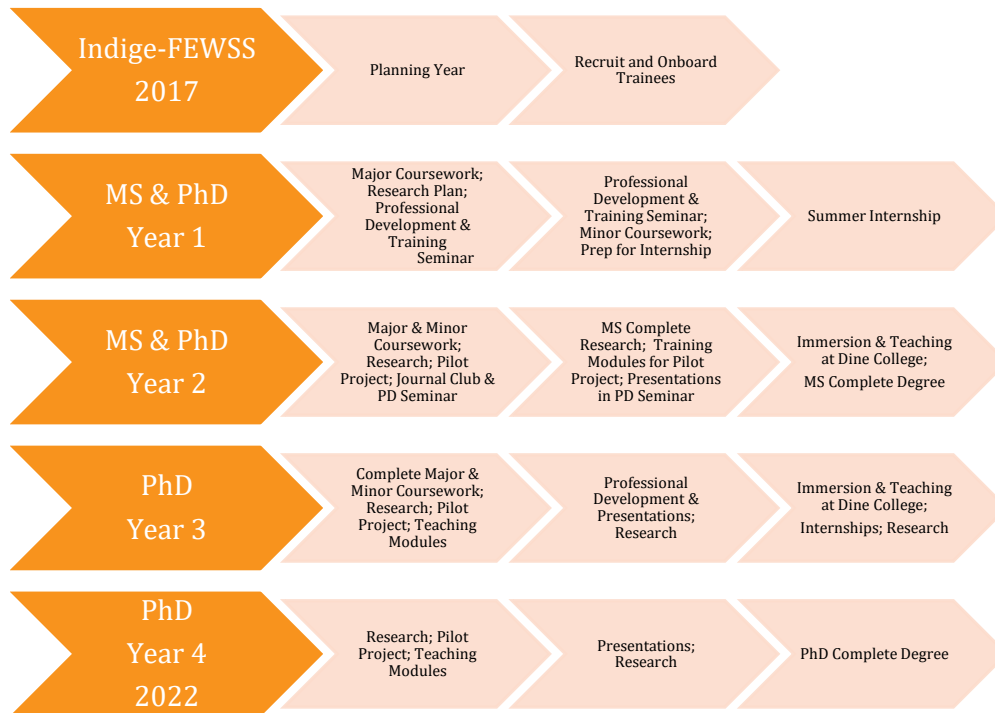
I have read and I agree to fulfill the Duties & Responsibilities of an NSF-NRT Trainee.

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NRT Fellow’s Signature

Date

## General Timeline



## NSF-NRT Research Goals & Theme

The overall **research theme** is the development of novel and sustainable solutions for off-grid production of safe drinking water, brine management operations, and controlled environment agriculture systems. This includes research in innovative photovoltaics; holographics; sensors and controls; unit operation technologies; and material, device, and systems resiliency. Specifically, Indige-FEWSS will build upon the following research activities:

- 1) Novel photovoltaic materials and technologies for Controlled Environment Agriculture
- 2) Management of coupled natural-human systems for production of fit-for-use water from brackish groundwater

The **expected outcomes** are:

- 1) Transformative advances in sustainable water and agricultural systems are achieved through graduate student driven transdisciplinary research.
- 2) Indigenous communities are directly involved in the development and piloting of the systems and are trained effectively to be able to inherit and maintain the systems.

Research Themes:

- 1) ***Novel Photovoltaic Materials & Technologies for Controlled Environment Agriculture: Design, Device Reliability & Resiliency.*** ***Investigators: Kacira, Ratcliff, Simmons-Potter***
  - ***Hypothesis:*** Use of semi-transparent OPV sheets as greenhouse cover can provide both sufficient light intensity and quality to achieve substantial, high-quality crop yields and power to operate an off-grid CEA system.
- 2) Management of coupled natural-human systems for production of fit-for-use water from brackish groundwater. ***Investigators: Arnold, Chief, Colombi, Ogden***
  - ***Hypothesis:*** SNF devices can be operated with algal bioreactors to produce potable and irrigation water using a fit-for-use treatment strategy that draws on Native knowledge of land and water practices.



## **GIDP Indige-FEWS PhD Minor**

### **Indige-FEWS PhD Minor Course Offerings for NSF-NRT Trainees**

Graduate Interdisciplinary Program: Indigenous Food, Energy and Water Systems (PhD Minor)

PhD students enroll in 4 courses: choose one course from each Block for 13 total credits.

MS students enroll in 2 courses: choose one course from Systems Block and one course from Society Block for 6 total credits.

#### Systems

**BE 579** “Applied Instrumentation for Controlled Environment Agriculture”

Offered: Fall

**BE 582** “Integrated Engineering Solutions in the Food-Energy-Water Nexus”

Offered: Fall

**GEOG 596J** “Water Management and Policy: Water-Energy-Food nexus”

Offered: Spring

#### Fundamentals

**ECE/OPTI 514A** “Photovoltaic Solar Energy Systems”

Offered: Spring

**ECE/MSE/OPTI 534** “Advanced Topics in Optical and Electronic Materials”

Offered: Spring (even years only)

**MSE 530** “Organic Electronic Materials and Devices”

Offered: Fall

**MSE 550** “Material Selection for the Environment”

Offered: Spring

#### Society

**AIS 526A** “Principles of Indigenous Economics”

Offered: Fall, Spring

**AIS 531A** “Traditional Ecological Knowledge”

Offered: Fall

**AIS 541A** “Natural Resource Management in Native Communities”

Offered: Fall, Spring

#### Unit Operations

**CHEE 514** “Sustainable Water Supplies for Remote Communities”

Offered: Spring

<https://grad.arizona.edu/catalog/programinfo/IFEWSMING>