F4R™: FEWSION™ for Community Resilience

INF423/EES423

Informatics for Community Food, Energy, and Water Systems
(Fall 2019)

Term	Class No.	Section	Units	Days & Times	Room	Mode
Fall 2019	8995/3519	001	3	T/Th 2:20pm-3:35pm	90-223	Face-to-face

Enrollment Requirements

Graduate status may be required depending on your degree program.

Course Website

TBD

Instructor(s)

Dr. Ben Ruddell (lead), Dr. Richard Rushforth (guest), Sean Ryan (guest)

Email: Benjamin.Ruddell@nau.edu, Richard.Rushforth@nau.edu, Sean.Ryan@nau.edu

Office Hours: TBD, and by appointment

Course Purpose

This course employs the FEWSION for Community Resilience (F4R) process and a related curriculum to engage participants in collecting data on the physical structure and stakeholder networks of their local supply chains and infrastructure, including Food, Energy, and Water (FEW) systems. Course participants will network with community leaders and stakeholders, NGO's, private sector businesses, utilities, emergency managers, and volunteers who contribute to the successful operation of these systems. Participants will employ field work to construct a detailed map of the system and contribute to an ongoing annual effort to quantify community supply chain systems. Training on software and data systems specialized for FEW supply chains will be delivered. The sustainability, equity, and security of the system will be studied and measured. Student projects will employ these relationships and data to study how policy and action can improve local systems.

Course Student Learning Outcomes

Upon successful completion of this course, students will be able to demonstrate the following competencies:

- Identify the major physical, environmental, and social components of a community's FEW system
- Utilize major US data resources relevant to a community's FEW system
- Demonstrate conceptual understanding of sustainability, vulnerability, efficiency, security, and resilience of a community's FEW system

Informatics for Community Food, Energy, and Water Systems
(Fall 2019)

- Define the boundaries and scope for investigation of a local community's FEW system
- Identify and utilize key tools and sources for data collection, visualization, and analysis of a community's FEW system
- Apply social network mapping and open-source research to identify a community's social FEW system stakeholders
- Apply research field methods necessary to collect and map a community's last-mile and mesoscale FEW system, both physical and social
- Assess major natural and human hazards facing a community's FEW system
- Quantitatively assess the concepts of sustainability, vulnerability, efficiency, security, and resilience of a community's FEW system
- Demonstrate familiarity with major FEW systems research papers and thought leaders
- Identify and provide evidence to depict the most important problems or questions facing a community's FEW system

Assignments / Assessments of Course Student Learning Outcomes

This is a project-based graduate course. The primary modes of assessment are participation, completion of weekly assignments, and completion of mid-term and final reports and presentations.

Grading System

A weighted sum of assessment components is used to determine your final grade in the course:

Attendance is a pass/fail criterion (see class policies)	P/F
Pop Quizzes on conceptual content of lectures and reading	15%
Supply chain research and data entry assignments (field work)	25%
Homework	20%
Final class report, analyzing a dimension of the FEW system & documenting it in the dossier	20%
Final class presentations, including stakeholder forum presentations if appropriate	10%
Final exam on conceptual content of lectures and reading	10%

Grades will be assigned using the weighted sum described above using this scale:

A ≥ 90%, **B** ≥ 80%, **C** ≥ 70%, **D** ≥ 60%, **F** < 60%.

There is no "curve". Each student's grade is based on their own outcomes assessments and not affected by the grades of other students. Extra credit opportunities may present themselves throughout the semester and will be announced during class meetings. Mistakes in grading do happen, and students are encouraged to discuss such concerns with the instructor during office hours.

F4R™: FEWSION™ for Community Resilience

INF423/EES423

Informatics for Community Food, Energy, and Water Systems
(Fall 2019)

Readings and Materials

Some content on the Google Drive for the class, and as assigned.

Saundry, P. and Ruddell, B.L. (eds.). (2020) "The Food-Energy-Water Nexus," (AESS Interdisciplinary Environmental Studies and Sciences Series). Springer, 978-3-030-29913-2. https://doi.org/10.1007/978-3-030-29914-9

Rushforth, Ryan, and Ruddell (2021). "FEWSION for Community Resilience." The facilitator version of this text includes supplementary materials required to engage in F4R for all sessions listed below.

Participants will be required to use a variety of software included in NAU's standard software distribution and most computer labs (particularly labs in 69-106 and 69-105).

Class Outline and Tentative Schedule

The course topics and a tentative schedule serve as an outline for the class. All topics and dates are subject to change with (at most) verbal in-class notice.

Week 1: Welcome and Introduction to FEWSION for Community Resilience, Community Report Overview, and Initial Data Collection Training

Week 2: Systems Thinking and Personal FEW

Week 3: Communicating Science: Defining Resilience, and Identifying Critical Community Resources

Week 4: The US Food System and the US Energy System

Week 5: The US Water System and FEW-View Visualization Tool Training

Week 6: Preliminary Analysis of the Food System

Week 7: Work Session and Assignment of Preliminary Analysis Groups by Sector

Week 8: Learning About the Community and Community Engagement Training

Week 9: Mid-term and Emergency Management

Week 10: Improving Capacity of Small Organizations, and Preliminary Analysis Reports and Presentations

Week 11: Collaborative Work Session and Stewardship Action Plans

Week 12: Communicating Science Part 2, and the Theory Behind Mesoscale Data and the FEW System

Week 13: Additional Analysis and Visualization Tools

Week 14: Draft Community Report, Peer and Expert Review

Week 15: Lessons Learned and Next Steps

Week 16 (Final Exam Week): Come prepared for the final Community Report Presentations and Submission

Informatics for Community Food, Energy, and Water Systems
(Fall 2019)

Note: There will be out-of-class opportunities for additional learning and community engagement that will include community meetings with stakeholders and volunteers, as well as field trips. These opportunities are extracurricular and optional but are designed to complement and build upon the learning objectives of this class.

Course Policies

The following policies will apply to this course:

- Attendance is required and absences will be recorded. If you are absent without prior excuse granted by the instructor, more than three times, you will be notified in writing that further absences may result in failing the class.
- Students who have not completed the prerequisite(s) for this course, or who are absent from the class during the first week may be administratively dropped from the course.
- The makeup and late work policies are as follows:
  o Quizzes: No make-ups or late submissions allowed.
  o Homework: No make-ups or late submissions allowed.
  o Exams: Make-up exams will be given only in the case of a documented emergency supported by a class missed memo from Student Life (https://nau.edu/student-life/classes-missed-memos/) **and** with approval from the instructor. Make-up exams may be considerably different than the original exam. Make-up exams must be taken within 3 business days of the original exam.
- Cheating and plagiarism are strictly prohibited. All academic integrity violations are treated seriously. All work you submit for grading must be your own. You are encouraged to discuss the intellectual aspects of assignments with other class participants. However, each student is responsible for formulating solutions on their own and in their own words. Academic integrity violations will result in penalties including, but not limited to, a zero on the assignment, a failing grade in the class, or expulsion from NAU.
- Electronic device usage must support learning in the class. All cell phones, PDAs, music players and other entertainment devices must be turned off (or in silent mode) during lecture and may not be used at any time. Laptops or workstations (if present) are allowed for note-taking and activities only during lectures; no web surfing or other use is allowed.
- Your final grade will be calculated in Excel using the grading system described above and then entered in LOUIE. Your final course grade will **not** necessarily appear in BBLearn. Please check LOUIE for your final grade. If you need a current tally of your grade, please request it of the instructor, in writing.
- Email to the instructor and teaching assistants must be respectful and professional.
- Visiting the instructor(s) during office hours is encouraged! I am happy to talk about the class, careers, research, and topics related (even loosely) to this course.

Informatics for Community Food, Energy, and Water Systems
(Fall 2019)

Appendix A. UNIVERSITY POLICY STATEMENTS (Updated 8/20/2018)

ACADEMIC INTEGRITY

NAU expects every student to firmly adhere to a strong ethical code of academic integrity in all their scholarly pursuits. The primary attributes of academic integrity are honesty, trustworthiness, fairness, and responsibility. As a student, you are expected to submit original work while giving proper credit to other people's ideas or contributions. Acting with academic integrity means completing your assignments independently while truthfully acknowledging all sources of information, or collaboration with others when appropriate. When you submit your work, you are implicitly declaring that the work is your own. Academic integrity is expected not only during formal coursework, but in all your relationships or interactions that are connected to the educational enterprise. All forms of academic deceit such as plagiarism, cheating, collusion, falsification or fabrication of results or records, permitting your work to be submitted by another, or inappropriately recycling your own work from one class to another, constitute academic misconduct that may result in serious disciplinary consequences. All students and faculty members are responsible for reporting suspected instances of academic misconduct. All students are encouraged to complete NAU's online academic integrity workshop available in the E-Learning Center and should review the full academic integrity policy available at https://policy.nau.edu/policy/policy.aspx?num=100601.

COURSE TIME COMMITMENT

Pursuant to Arizona Board of Regents guidance (Academic Credit Policy 2-224), for every unit of credit, a student should expect, on average, to do a minimum of three hours of work per week, including but not limited to class time, preparation, homework, and studying.

DISRUPTIVE BEHAVIOR

Membership in NAU's academic community entails a special obligation to maintain class environments that are conductive to learning, whether instruction is taking place in the classroom, a laboratory or clinical setting, during course-related fieldwork, or online. Students have the obligation to engage in the educational process in a manner that does not breach the peace, interfere with normal class activities, or violate the rights of others. Instructors have the authority and responsibility to address disruptive behavior that interferes with student learning, which can include the involuntary withdrawal of a student from a course with a grade of "W". For additional information, see NAU's disruptive behavior policy at https://nau.edu/university-policy-library/disruptive-behavior.

NONDISCRIMINATION AND ANTI-HARASSMENT

NAU prohibits discrimination and harassment based on sex, gender, gender identity, race, color, age, national origin, religion, sexual orientation, disability, or veteran status. Due to potentially unethical consequences, certain consensual amorous or sexual relationships between faculty and students are also prohibited. The Equity and Access Office (EAO) responds to complaints regarding discrimination and harassment that fall under NAU's Safe Working and Learning Environment (SWALE) policy. EAO also assists with religious accommodations. For additional information about SWALE or to file a complaint, contact EAO located in Old Main (building 10), Room 113, PO Box 4083, Flagstaff, AZ 86011, or by phone at 928-523-3312 (TTY: 928-523-1006), fax at 928-523-9977, email at equityandaccess@nau.edu, or via the EAO website at https://nau.edu/equity-and-access.

Informatics for Community Food, Energy, and Water Systems
(Fall 2019)

TITLE IX

Title IX is the primary federal law that prohibits discrimination on the basis of sex or gender in educational programs or activities. Sex discrimination for this purpose includes sexual harassment, sexual assault or relationship violence, and stalking (including cyber-stalking). Title IX requires that universities appoint a "Title IX Coordinator" to monitor the institution's compliance with this important civil rights law. NAU's Title IX Coordinator is Pamela Heinonen, Director of the Equity and Access Office located in Old Main (building 10), Room 113, PO Box 4083, Flagstaff, AZ 86011. The Title IX Coordinator is available to meet with any student to discuss any Title IX issue or concern. You may contact the Title IX Coordinator by phone at 928-523-3312 (TTY: 928-523-1006), by fax at 928-523-9977, or by email at pamela.heinonen@nau.edu. In furtherance of its Title IX obligations, NAU will promptly investigate and equitably resolve all reports of sex or gender-based discrimination, harassment, or sexual misconduct and will eliminate any hostile environment as defined by law. Additional important information about Title IX and related student resources, including how to request immediate help or confidential support following an act of sexual violence, is available at http://nau.edu/equity-and-access/title-ix.

ACCESSIBILITY

Professional disability specialists are available at Disability Resources to facilitate a range of academic support services and accommodations for students with disabilities. If you have a documented disability, you can request assistance by contacting Disability Resources at 928-523-8773 (voice), 928-523-6906 (TTY), 928-523-8747 (fax), or dr@nau.edu (e-mail). Once eligibility has been determined, students register with Disability Resources every semester to activate their approved accommodations. Although a student may request an accommodation at any time, it is best to initiate the application process at least four weeks before a student wishes to receive an accommodation. Students may begin the accommodation process by submitting a self-identification form online at https://nau.edu/disability-resources/student-eligibility-process or by contacting Disability Resources. The Director of Disability Resources, Jamie Axelrod, serves as NAU's Americans with Disabilities Act Coordinator and Section 504 Compliance Officer. He can be reached at jamie.axelrod@nau.edu.

RESPONSIBLE CONDUCT OF RESEARCH

Students who engage in research at NAU must receive appropriate Responsible Conduct of Research (RCR) training. This instruction is designed to help ensure proper awareness and application of well-established professional norms and ethical principles related to the performance of all scientific research activities. More information regarding RCR training is available at https://nau.edu/research/compliance/research-integrity.

SENSITIVE COURSE MATERIALS

University education aims to expand student understanding and awareness. Thus, it necessarily involves engagement with a wide range of information, ideas, and creative representations. In their college studies, students can expect to encounter and to critically appraise materials that may differ from and perhaps challenge familiar understandings, ideas, and beliefs. Students are encouraged to discuss these matters with faculty.