

**Viewpoints in Environmental Studies:
ENVI F150: ACEP Microgrid Boot Camp
(CRN 51516)**

**University of Alaska Fairbanks (UAF) | Bristol Bay Campus
Summer 2021 1 credit**

Instructor Information

Name: Eric Goddard

Co-instructors/partners: Patty Eagan (pmeagan@alaska.edu) and Heike Merkel (ACEP) (hmerkel@alaska.edu)

Email and Phone: esgoddard01@alaska.edu, 907-843-2233

Office Location and Hours: Call or email for an appointment.

Course Meeting Information

Dates: Online Zoom meeting dates: May 10 – 14, 2021, course assignments due May 21, 2021

Day and Time: Monday - Friday; 8:00am to 5:00pm (5/10 - 5/14/21); course assignments due 5/21/2021 @ 5:00pm

Class Location: Online, synchronous class using Zoom Meetings and Google Drive for posting/submitting assignments, announcements, and grades.

Course Description

Alaska has many unique energy challenges and landscapes creating a model backdrop for microgrid energy utility observation, design, and analysis integrating traditional and renewable energies. This class is a continuing education opportunity following the Alaska Energy Utility Lecture Series (ACEP/UAF collaboration). Returning students learned the dynamic operations, management and employment challenges in Alaska's rural and urban electric utilities from a variety of lecturers with various backgrounds and perspectives.

The Microgrid Boot Camp intensive workshop is a collaborative effort between the Alaska Center for Energy and Power (ACEP), Arizona State University (ASU) and UAF Bristol Bay Campus. The course is an online (due to COVID-19 distancing requirements) training designed to introduce students to various microgrid energy systems and the challenges facing them. Students will explore the unique energy demand challenges both on and off the Railbelt and road systems in Alaska, as well as permanently islanded microgrids. Students will gain understanding of regulatory and policy procedures as well as economics and social science in relation to energy-related behaviors. Various types of microgrids will be evaluated, including off-grid and mini-grid systems. Fulfillment of learning objectives takes place through online presentations, lectures, virtual power plant tours, question/answer sessions, and hands-on activities. Various software tools and games-as-a service will be utilized for virtual hands-on activities. One hands-on activity is the design of a village microgrid in XENDEE, a software that allows design and analysis of microgrid resilience, finances, CO2 emissions, model projected cost changes and technology degradation for future upgrades and more. Additional concepts introduced will include supervisory control and data acquisition (SCADA) systems in conjunction with research efforts at the ACEP Power Systems Integration (PSI) Lab. The course will be delivered online in a synchronous format through Zoom Meeting and Google Drive (as needed for assignments).

Course Prerequisite/Co-requisites: None – students do not need to have any previous knowledge.

Required Text and Learning Materials: No required text – materials will be provided by the instructor and available through ACEP/ASU presenters and Google Drive as needed.

Student Learning Objectives and Outcomes: In this class, learning requires partnership. At the end of this course, if you actively engage in class, activities, study outside of class, complete assignments and journal, you will be able to:

1. Understand the basic technical, financial, environmental, and social aspect of microgrid designs.
2. Describe the various energy sources (traditional, alternative and renewable) Alaska utilities currently use, the electrical loads a utility must satisfy, and the daily and seasonal changes in energy demand.
3. Consider the challenges and opportunities faced by utilities when implementing energy efficiency measures or integrating renewable energy systems into existing (diesel) systems.

4. Understand the optimization of a microgrid using reasonable assumptions and input parameters and the importance of data collection to plan for the future.
5. Understand the impact of relatively large energy users, such as water/wastewater utilities, schools and other community buildings, and industrial loads like fish processing plants, on a small electric utility.

Instructional Methods

This course is an intensive five-day workshop including lectures, discussions, hands-on exercises, other virtual applications and may include homework and additional reading.

Grading

This class is graded on a Pass-Fail scale. Grading will be based upon a percentage of the total points earned for quizzes, homework and attendance. You must achieve a score of 70% or better to pass. Your grade will be determined as follows:

Attendance and participation 20%

Students are expected to attend all class sessions, take notes and actively participate in group discussions.

Class exercises and review 40%

Homework assigned as needed.

Final Journal 40%

Assignments and Course Schedule

The instructor reserves the right to change the assignment requirements depending upon class progress. Assignment due dates are shown on the course schedule.

Course Policies

Classroom Rules

1. Students are expected to comply with the UAF Student Code of Conduct: <https://uaf.edu/deanofstudents/student-code-of-conduct/>
2. Cellphones are to be turned off and put away. Do not take them out during class.
3. Be on time. Late entrances disrupt others.
4. Please respect the rights of others to learn. Behaviors that distract attention from lecture or class activities will not be tolerated. Conduct that unreasonably interferes with the learning environment or that violates the rights of others is prohibited by the standards and guidelines collectively described as the UA Student Code of Conduct.
5. Do not share the Zoom link with anyone outside of the class.
6. This course is in a virtual meeting format. Please do not allow unnecessary distractions from home residents, pets, etc. during sessions.

Attendance

Regular attendance is necessary for success at the collegiate level. You are expected to actively participate in all classroom sessions. Make sure that you are prompt and that you stay for the scheduled class time. Experience has shown that due to the time constraints of this course your grade will be jeopardized if you are absent from class.

Google Drive

Assignments will be submitted to a specified Google Drive. Please review the academic integrity section of this syllabus regarding items submitted to Google Drive.

Zoom Meeting

Zoom will be used for lectures, presentations, group activities, and discussions.

University Policies and Services

Academic Integrity

Academic integrity is a basic principle that requires that students only take credit for ideas and efforts that are their own. Cheating, plagiarism, and other forms of academic dishonesty are defined as the submission of materials in assignments, examinations, or other academic work that is based on sources prohibited by the faculty member. Substantial portions of academic work that a student has submitted for a course may not be resubmitted for credit in another course without the knowledge and advance permission of the instructor. For more information, refer to the UAF Student Code of Conduct:

<https://uaf.edu/deanofstudents/student-code-of-conduct/>

Student Protections and Services

Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX, <https://uaf.edu/titleix/>), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: www.uaf.edu/handbook/.

Support Services

Students have been advised of the UAF's Writing Center. In addition, each instructor is available before, during, and after the seminar dates to provide academic support to each student, as needed.

- Office of Information Technology 907-450 8300 (1-800-478-8226)
Their website can be found at www.alaska.edu/oit/index.xml or email: helpdesk@alaska.edu
- Off-campus library 907-474-7482 (1-800-478-5348) <http://library.uaf.edu/offcampus>
- UAF Writing Center 907 474 5314 or email for an appointment at uaf-writing-center@alaska.edu
Their website can be found at <http://www.uaf.edu/english/writing-center/>
- UAF Bookstore 907 474 7348 or email uaf@bkstr.com <https://www.bkstr.com/alaskafairbanksstore>

Rural Student Services: Responding to student needs by providing quality services to Native and rural students who expend positive effort in the pursuit of higher education and its opportunities. Please see: <https://uaf.edu/ruralss/>.

Additional student support services can be found here: <https://www.uaf.edu/ruralss/tutoring-services/>.

Bristol Bay Campus: Advising, tutoring, registration, financial aid, and other student services may be offered through the Bristol Bay Campus. Call 907-842-5109 to learn more.

UAF Help Desk: Go to <https://alaska.edu/oit/> to see about current network outages and news. Reach the Help Desk at: helpdesk@alaska.edu or 907-450-8300 (in the Fairbanks area) or 1-800-478-8226 (outside of Fairbanks).

Effective Communication Resources:

- UAF Speaking Center (907-474-5470, speak@uaf.edu, Gruening 507)
- Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Gruening 8th floor)
- UAF Math Services, uafmathstatlab@gmail.com, Chapman 305 (for math fee paying students only)
- Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120).
- Developmental Math Lab, Gruening Building, Rm 406

For more information and resources, please see the academic advising resource list:

https://www.uaf.edu/advising/lr/SKM_364e19011717281.pdf

Veteran and Military Support Services: UAF is committed to all veterans and military students—active duty, reserve, guard, separated and retired—as well as their dependents who are exploring UAF's academic opportunities. Staff members in Financial Aid,

Admissions, Career Services, Veterans' Services and the Veterans' Resource Center are here to help you with any challenges you encounter while working while in or transitioning from a military to an academic environment. Please contact the Veterans Resources Center, 907-474-2475, <https://uaf.edu/veterans/> in room 111 in the Eielson Building.

Emergency Notification Plan: Students will receive emergency notifications via phone or email. Please check your uonline account to confirm your emergency notification settings. For more information, please refer to the student handbook: <https://www.uaf.edu/handbook/> or in cases where you do not have access to your devices, as your instructor, I will take responsibility to relay any emergency notifications.

COVID-19, Addition and Policy: Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website: <https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0>. Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.