

Course Syllabus
UAF Bristol Bay Campus
CRN: 37856

Term:	Spring 2021
Course Title:	Solar Energy Basics
Dept. & Num:	ENVI F150
Credits:	1
Prerequisites:	none
Dates/Days/Times:	April 21-23, 2021. W/TR 8 AM – 4:30 PM, Friday 8-11:30 AM
Location:	Distance, Aleut community of St. Paul
Course Type:	Online Synchronous

Instructor:	Eric Goddard
Position:	Assistant Professor
Phone:	907-843-2233
Fax:	
Email:	esgoddard01@alaska.edu
Hours	By appointment
Available:	

Text:	A Solar Design Manual for Alaska, 5 th ed. (2018). C. Pike and A. Nash, eds. UAF Cooperative Extension Publication EEM-01255. Available free as a PDF download via: http://cespubs.uaf.edu/publications?s=solar+design+manual&submit=Search+Now
Supplies:	none

Course Description: Presents basics of utilization, design and installation of solar electric and hot water energy systems. Emphasis on residential-scale systems; principles apply to larger applications also. Introduces basic physics related to solar energy, harvesting solar energy, system components, design considerations, energy storage, installation and cost/benefit considerations, career opportunities, and safety.

Instructional Methods:

This class can be taught online or in-person, and involves lectures, discussion and exercises.

Goals & Objectives:

The goal of this class is to present the fundamental concepts of the utilization, design and installation of solar electric and solar hot water systems. Course objectives are listed in the Student Learning Outcomes.

Student Learning Outcomes:

In this class, learning requires partnership. For each hour spent in class, plan to spend at least two hours studying outside of class each week. At the end of this course, if you actively engage in class, study outside of class, complete assignments and prepare for exams, you will be able to:

1. Describe the basic uses, differences and similarities between solar electric and solar hot water systems
2. Describe the primary components, and their functions, of both solar electric and solar hot water systems
3. Consider the benefits and costs of solar energy systems for use in specific locations
4. Explain the relationship of energy efficiency measures and solar energy system(s) development
5. Describe the general design and installation considerations important when considering solar energy systems
6. Discuss general solar energy system operation, maintenance, and safety considerations
7. Describe career opportunities related to the solar energy industry

Course Calendar:

Sessions	Topics To Be Covered	Assignments, Quizzes, Tests
Section 1	Part 1: Course goals & objectives, introductions, expectations, resources Part 2: Understanding the Sun and Solar Energy – Characteristics of and Quantifying the Solar Resource	
Section 2	Continue Part 2: Optimizing the Solar Resource, Solar Measurement Tools, Solar Site Considerations Discussion – Solar Insolation (with handout) Part 3 – Solar Electric (photovoltaic) Systems: Technology basics, Systems Types, Balance of System	Reading: p. 3-12 Solar Design Manual Exercise 1: Radiation Types Exercise 2: Tilt Angles Exercise 3: Site Considerations
Section 3	Continue Part 3 – Solar Electric Systems: System Types, Balance of System, PV Installation Assessing Demand and Sizing PV Array Exercise – PV Array Sizing Exercise: PV Watts calculator	Reading: p. 13-50 Solar Design Manual Homework: Section 2 review
Section 4	Part 4 – Solar Hot Water: Intro and History, Collectors, Balance of System, DHW loads, Case Studies	Reading: p. 51-64 Solar Design Manual Homework: Exercise 2 due Section 3 review due
Section 5	Part 5 – Economic Assessment Part 6 – Planning, regulations, safety, operations, maintenance Part 7 – Careers and industry trends Part 8 – Case Studies Final Exam assigned	Homework: Section 4 review Final Exam – due in 3-5 days

Course Policies:

- UAF requires students to conduct themselves honestly & responsibly, & to respect the rights of others. Students are expected to comply with the UAF Student Code of Conduct: <https://uaf.edu/deanofstudents/student-code-of-conduct>
- Cellphones are to be turned off and put away. Please do not take them out during class unless for instructional purposes or emergency.
- Be on time. Attendance is mandatory.

- Late assignments are not accepted without prior approval of instructor.
- The instructor reserves the right to amend this course outline as needed.

Evaluation:

Attendance & Participation	25%
Exercises, Homework, Reviews	50%
Final Exam	25%

Grading Policy: Pass Fail will be tabulated by an absolute score.

Pass/Fail

This course will be graded pass/fail. In order to receive a passing grade, participants must receive a 70% or higher grade.

The instructor reserves the right to amend this course outline as needed.

Student Protections and Services Statement:

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. The Office of Disability Services implements the Americans with Disabilities Act (ADA). I will work with the Office of Disabilities Services (208 Whitaker, 907-474-5655) to provide reasonable accommodations to students with disabilities uaf.edu/disability. Students at this university are protected against sexual harassment and discrimination (Title IX), 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 uaonline 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.