

PHYS 102X – Energy and Society (3+3)

Term:	Spring 2021
Course Title:	Energy and Society
Dept. & Num:	PHYS 102X
Credits:	4
Prerequisites:	Placement in ENGL 111X or higher; placement in DEVM 105 or higher; or permission of instructor
Dates:	Spring 2021 – all semester
Days and Times:	Lectures: Tuesday, Thursday 5:10-6:40pm; Labs: Independently
Location:	Lectures: Online; Labs: Combination of online and lab kit

Instructor:	Dr. Tom Marsik
Position:	Associate Professor
Phone:	450-1785
Email:	tmarsik@alaska.edu
Office Location:	Cold Climate Housing Research Center
Hours Available:	By Appt.

Required Text: Energy and the Environment (3 rd Edition): R. Ristinen, J. Kraushaar, and J. Brack

Course Description:

Exploring the concept of energy. Investigation of the sources, conversion, distribution and ultimate dispersion of energy, as well as the consequences of its use in the development and maintenance of modern society.

Instructional Methods:

Blackboard collaborate / teleconference lectures are closely integrated with homework exercises and independent projects. Email and Blackboard are used for off-class communication, sharing material, and exams. Labs are performed by distance using a lab-kit and online tools.

Lecture Topics:

The course begins with definitions of power and energy with emphasis on common terms such as BTUs, horsepower, and kilowatt hours. Reserves of the exhaustible sources of energy (coal, oil, natural gas, and uranium) will be discussed and projections will be made of the times at which these will become exhausted as a result of increased population and improved standards of living. The thermodynamic limits to improved energy efficiency will be discussed and techniques for making use of waste heat. Alternative energy sources (wind, solar, geothermal, tides, and hydroelectric) will be discussed and projections will be made of their possible future impact. Promise and problems of nuclear energy will be explored. The course will discuss ways to save energy, which covers topics such as thermal insulation and energy efficient lighting and appliances. Energy used for transportation will be explored. In the end, the air pollution and global effects associated with energy use and production will be discussed. Throughout the course, the relationship between the covered scientific knowledge and public policy will be explored.

Course Goals:

To provide education that will help solve the current energy situation.

Student Learning Objectives:

Upon successful completion of this course, students will be able to:

- Answer questions such as the energy savings of more efficient appliances or automobiles, or the installation of storm windows or attic insulation.
- Understand and make informed decisions about legislation relating to the regulation of energy sources, pollution from energy sources, energy efficiency standards, “zero” pollution vehicles and public investment in mass transit.

Course Policies:

1. UAF requires students to conduct themselves honestly and responsibly, and to respect the rights of others.
2. You are encouraged to attend and actively participate in all lectures.
3. All labs and reports must be completed to get a passing grade for the lab. A passing grade in the lab is necessary to pass the course.
4. **Late lab reports will not be accepted without prior arrangements and will result in failure of the course.**
5. **Lab kits must be mailed back using a pre-paid shipping label by Tuesday April 20, 2021. Neglecting to do so will result in an I (incomplete) grade and a hold on the student’s account.**

6. Homework will be assigned each Tuesday and due at 11:59pm the following Tuesday. You are encouraged to discuss homework questions with your peers, but you are not allowed to copy.
7. **Late assignments will not be accepted without prior approval of instructor.**
8. Student presentations must be delivered when scheduled.
9. The instructor reserves the right to amend this course outline as needed.

Course Calendar:

See attached.

Midterm and Final Exams:

Exams will be open book, open notes, and will be taken via Blackboard.

Midterm 1 will cover all material covered up to that point.

Midterm 2 will cover mainly material covered between Midterm1 and Midterm 2.

Final exam will cover all material from the whole semester.

Quizzes:

A few quizzes will be given in class during the semester. At the end of each quiz, the solution will be discussed and students will self-evaluate their solutions. Even though there is no formal grade for quizzes, students' participation in discussing the solution will count towards the participation grade.

Projects:

The project will be in the form of researching a topic related to the course that you find interesting and we agree on together. These projects could include for example literature review regarding energy technologies, or scientific projects. Every student will deliver a 10-15 min presentation to the rest of the class followed by a short discussion. They will be graded both for presentation and content.

Labs:

Labs will be done by distance using a combination of online tools and a lab-kit. In the labs, students will familiarize themselves with methods for the acquisition and expansion of scientific knowledge, including: a) data collection and analysis, b) hypothesis building, and c) experimentation. See the attached tentative schedule for lab topics and more information about the labs.

Evaluation:

Participation	10%
Homework assignments	10%
Projects	10%
Midterm exams	30%
Final exam	20%
Labs	20%

Grading Policy:

Letter Grades

A+	96.7 – 100%
A	93.3 – 96.7%
A-	90.0 – 93.3%
B+	86.7 – 90.0%
B	83.3 – 86.7%
B-	80.0 – 83.3%
C+	76.7 – 80.0%
C	73.3 – 76.7%
C-	70.0 – 73.3%
D+	66.7 – 70.0%
D	63.3 – 66.7%
D-	60.0 – 63.3%
F	Below 60%

Student Protections Statement:

UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on

your rights as a student and the resources available to you to resolve problems, please go to the following site:
<https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities>.

I will work with the [Office of Disability Service](#) to provide reasonable accommodation to students with disabilities. Contact information: uaf-disability-services@alaska.edu
Phone: 907.474.5655 or TTY: 907.474.1827 or Fax: 907.474.5688

Support Services:

Go to the Student Handbook (www.uaf.edu/handbook) for things like: academic advising, tutoring, library and academic support, disability services, computing and technology, veteran and military support, academic complaint and appeals, late withdrawals, “classroom” behavior expectations and more.

Notice of Nondiscrimination:

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual:
www.alaska.edu/nondiscrimination.

COVID-19 Statement:

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.