Syllabus

TITLE:	Energy and Society
NUMBER:	PHYS 102X
CREDITS:	4
PREREQUISITES:	Placement in WRTG 111X or higher; placement in MATH 105 or higher; or permission of instructor
LOCATION:	Online course
MEETING TIME:	Asynchronous course (no fixed meeting time)
COURSE TYPE:	Online asynchronous

INSTRUCTOR:	Dr. Tom Marsik
OFFICE LOCATION:	Cold Climate Housing Research Center, Office 215B
OFFICE HOURS:	By appointment
TELEPHONE:	907-474-5419
EMAIL ADDRESS:	tmarsik@alaska.edu

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.

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.

Lab Topics

Lab 1 – Online power plant tours
Lab 2 – CCHRC (Cold Climate Housing Research Center) online tour
Lab 3 – ACEP (Alaska Center for Energy and Power) online tour

Lab 4 – Simple machines
Lab 5 – Human power and food energy
Lab 6 – Analyze a bad example of scientific research design
Lab 7 – Heat transfer
Lab 8 – Home energy
Lab 9 – DC circuits 1
Lab 10 – DC circuits 2 + AC circuits
Lab 11 – Photovoltaics

COURSE GOALS

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

STUDENT LEARNING OUTCOMES

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 READINGS/MATERIALS

Required Text:
Energy and the Environment (4th Edition): R. Ristinen, J. Kraushaar, and J. Brack

TECHNICAL REQUIREMENTS FOR COURSE

Regular access to a computer and the Internet to access online materials in Canvas and to submit assignments. Required software: MS Word and MS PowerPoint.

INSTRUCTIONAL METHODS

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

COURSE CALENDAR

See the "Course Completion Guide".

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 22, 2025. 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.

EVALUATION POLICIES

Final grades are calculated from the points earned in the following areas:

Attendance and Participation 10%
Students are expected to attend and actively participate in all sessions (this can be done synchronously or asynchronously).

Homework 10%
It will consist of problems and questions related to recently covered material in lectures. It will be assigned each Tuesday and due at 11:59pm the following Tuesday.

Projects 10%
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.

Midterm Exams 30%
Midterm exams will be open book, open notes, and will be taken via Canvas. Midterm 1 will cover all material covered up to that point. Midterm 2 will cover mainly material covered between Midterm1 and Midterm 2. Honesty system will be used (no proctoring).

Final Exam 20%
Final exam will be open book, open notes, and will be taken via Canvas. It will cover all material from the whole semester. Honesty system will be used (no proctoring).

Labs 20%
Labs will be done by distance using a combination of online tools and a lab-kit. See the "Labs" folder in Canvas for lab topics and more information about the labs.

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%

"C" (including C+ and C-) indicates a satisfactory level of acquired knowledge and performance in completion of course requirements.

C– (1.7) is the minimum acceptable grade that undergraduate students may receive for courses to count toward the major or minor degree requirements, or as a prerequisite for another course. A minimum grade of C (2.0), however, MAY be required by specific programs for prerequisite and/ or major / minor courses. Please consult specific program listings in the UAF Catalog.

C– (1.7) is the minimum acceptable grade required for all Core (X) Courses.

"D" (including D+ and D-) indicates a minimal level of acquired knowledge and minimal performance in completion of course requirements. This grade does not satisfy requirements for courses in the major, minor, Core, or graduate programs.

ACADEMIC INTEGRITY

As described by UAF, scholastic dishonesty constitutes a violation of the university rules and regulations and is punishable according to the procedures outlined by UAF. Scholastic dishonesty includes, but is not limited to, cheating on an exam, plagiarism, and collusion. Cheating includes providing answers to or taking answers from another student. Plagiarism includes use of another author's words or arguments without attribution. Collusion includes unauthorized collaboration with another person in preparing written work for fulfillment of any course requirement. Scholastic dishonesty is punishable by removal from the course and a grade of "F." For more information go to Student Code of Conduct.

EXPLANATION OF NB/I/W GRADES

This course adheres to the UAF regarding the granting of NB Grades *The NB grade is for use only in situations in which the instructor has No Basis upon which to assign a grade. In general, the NB grade will not be granted.*

Your instructor follows the University of Alaska Fairbanks Incomplete Grade Policy:

"The letter "I" (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of work in a course but for personal reasons beyond the student's control, such as sickness, he has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an "I" grade."

Successful, timely completion of this course depends on committing yourself early and maintaining your effort. Failure to submit assignments in a timely manner may result in faculty-initiated Withdrawal from the course, which can result in a **W** on your transcript.

INSTRUCTOR RESPONSE TIME

Generally, emails will be responded to within 24 hours (except for weekends). Graded material with instructor's comments will generally be returned within 48 hours after assignment due date.

HOW TO CHECK YOUR GRADE

To check your grades for assignments, click on the Grades link in the sidebar menu in Canvas.

EFFORT AND STUDENT INVOLVEMENT

Student effort/time is expected to be distributed in the course approximately as follows:

Instruction: Lecture/Readings 35%
Individual Research: Project and presentations 15%
Assignments: Homework 15%
Labs: Labs 25%
Collaboration: Discussion Board 10%

EXPECTATION OF STUDENT EFFORT

Students should expect to spend about 12 hours per week on this class. Students are expected to complete the weekly assignments by their due dates. If circumstances arise that cause you to need extra time on any assignment(s), email your instructor or lab supervisor for guidance. Extensions of due dates may be granted, but your instructor or lab supervisor expects to be informed in advance if you are not able to submit your assignment on time. Students are expected to maintain a working backup plan to be implemented in the event of a computer malfunction or an interruption of their normal Internet service during the course.

REGULAR AND SUBSTANTIVE INTERACTION

To be compliant with federal law and Northwest Commission on Colleges and Universities (NWCCU) accreditation requirements, UAF faculty must ensure that all courses where faculty and students are not physically located in the same space for which students use federal financial aid have regular and substantive interaction (RSI) between students and instructors. Regular refers to interactions that are scheduled and predictable. Substantive refers to engaging students in teaching, learning, and assessment, consistent with course content. As your faculty member, I have included

the following actions in the course to meet RSI requirements:

- Providing direct instruction
- Providing feedback on student coursework

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.

DISABILITY SERVICES STATEMENT

I will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities.

ASUAF ADVOCACY STATEMENT:

The Associated Students of the University of Alaska Fairbanks, the student government of UAF, offers advocacy services to students who feel they are facing issues with staff, faculty, and/or other students specifically if these issues are hindering the ability of the student to succeed in their academics or go about their lives at the university. Students who wish to utilize these services can contact the Student Advocacy Director by visiting the ASUAF office or emailing asuaf.office@alaska.edu.

STUDENT ACADEMIC SUPPORT

- Communication Center (907-474-7007, uaf-commcenter@alaska.edu, Student Success Center, 6th Floor Room 677 Rasmuson Library)
- Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Student Success Center, 6th Floor Room 677 Rasmuson Library)
- UAF Math Services (907-474-7332, uaf-traccloud@alaska.edu)
  - Drop-in tutoring, Student Success Center, 6th Floor Room 677 Rasmuson Library
  - 1:1 tutoring (by appointment only), Chapman 210
  - Online tutoring (by appointment only) available https://www.uaf.edu/dms/mathlab/, available at the Student Success Center
- Developmental Math Lab, (Gruening 406, https://www.uaf.edu/deved/math/)
- The Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120, https://www.ctc.uaf.edu/student-services/student-success-center/)
- For more information and resources, please see the Academic Advising Resource List (https://www.uaf.edu/advising/students/index.php)

STUDENT RESOURCES

- Disability Services (907-474-5655, uaf-disability-services@alaska.edu, 110 Eielson Building)

- Student Health & Counseling [**free counseling sessions available**] (907-474-7043, https://www.uaf.edu/chc/appointments.php, Whitaker Building 2nd floor)
- Office of Rights, Compliance and Accountability (907-474-7300, uaf-orca@alaska.edu, 3rd Floor, Constitution Hall)
- Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, asuaf.office@alaska.edu, Wood Center 119)

NONDISCRIMINATION STATEMENT

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UAF Office of Rights, Compliance and Accountability
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