Syllabus

Energy: Forms and Functions

Course description: We will explore the concept of energy and its applications, from photosynthesis to physics to everyday life. We will learn about the history of harnessing energy, the current statistics related to energy production and consumption, and the interactions between energy and the environment. Throughout, we will consider choices we have about energy use at the individual, regional, and national levels.

- Class meets 8 - 9:30 a.m. Mondays, Wednesdyas, and Fridays in Tioga Library Building TLB 115.
- **Professor:** Allen Olson
- **Office:** KEY 202
- **Office hours:** 9:30-10am M/W/F or email me to set up times to meet
- **Email:** aholson@uw.edu or through Canvas
- **Telephone:** 360-867-5485
- **SIAS Program Office:** 253-692-4450
- **Texts:**
  - Smil V, *Energy: A Beginner's Guide*, London: Oneworld Publications; 2017.
  - Knaflic C, *Storytelling with Data*, Hoboken, NJ: John Wiley & Sons; 2015.

Mentoring

I am flexible about setting up times to meet with students or talk by phone to discuss class work or other issues related to college. Because I work mostly with students who have many other demands on their time, I have found it easiest to arrange times individually by coordinating through email. I am also willing to set up and show up to group study sessions. So please, **contact me!** This is part of my role as a faculty member. Asking for my assistance is expected, and I enjoy providing it!

Learning Objectives

This course is part of the CORE at UW-Tacoma and focuses on providing a general introduction to the disciplines of the natural sciences while specifically studying standard concepts in the physics of energy and in the visual presentation of data. To do this work, there is a substantial set of vocabulary and notation that students must become comfortable using. There is also a level of mathematical manipulation of concepts expected of students that assumes strong arithmetic and algebra skills.

This course also emphasizes habits of mind that promote academic persistence, critical and creative thinking, communication, and continual growth as a learner.

Finally, an underlying goal is to enhance students' appreciation of some of the methods of physics and the wonders of nature while also considering the way that science and society interact, especially when it comes to making decisions about policies and ways to move into the future as individuals and as groups.

Learning Outcomes: During the first part of the course, students will choose from the following learning outcomes and develop a plan to demonstrate the chosen learning outcomes:

- Collect, evaluate, and analyze information and resources to solve problems or answer questions.
- Approach complex issues by taking a large question and breaking it down into manageable pieces.
- Make meaningful connections among assignments and readings in order to develop a sense of the 'big picture.'
- Formulate an original thesis-driven argument and sustain it in both written and verbal communication.
- Identify, analyze, and summarize/represent the key elements of a text.
- Enter/place themselves into an existing dialogue (intellectual, political, etc.).
- Express ideas clearly in writing and speaking in order to synthesize and evaluate information before presenting it.

- Understand events and processes as ‘disciplinarily’ situated.
- Interact with concepts, ideas, and processes related to the interdependences between personal, local, and global relationships.
- Think outside of cultural norms and values, including their own perspectives, to critically engage the larger world.
- Interact with concepts, ideas, and processes related to civic engagement.
- Use quantitative evidence (including statistics, graphs, etc.) in support of an argument.
- Analyze and evaluate a chart or graph and interpret it (through discussion, a written assignment, etc.).
- Find quantitative data to support an argument.
- Demonstrate scientific reasoning and evidence.
- Identify problem-specific methodologies.
- Engage in oral and written scientific discourse.
- Analyze data using a spreadsheet.

Evaluation

The following components will be considered in the evaluation of each student:

- Final exam and other assessments: Quick quizzes and longer assessments will happen weekly online, in class, or both.
- Projects: As a class, we will choose research and data display projects to pursue individually and in small groups to demonstrate learning outcomes chosen from the list above.
- Homework exercises and workshop activities: Each week there will be some sort of handouts or activities to complete in class and a set of exercises to work on outside of class.
- Reflection: Students will have regular self-assessment assignments focused on chosen learning outcomes as well as habits of mind, attitudes toward learning, and other metacognitive skills.
- Professionalism: This broad category includes preparation, class attendance and participation, and communication with the professor about issues and absences. In this setting, the student's professional role involves both achieving individual learning as well as supporting and contributing to the learning of others.

Reasonable accommodations related to any course activities and assessments will be made for students with documented disabilities per arrangements through Disability Support Services.

Grading

- 25% - Comprehensive final exam (8 a.m. on Monday, Dec. 11)
- 25% - Projects
- 20% - Quizzes and other assessments
- 20% - Homework assignments and reflection
- 10% - Professionalism

Late Work and Makeups

While my general approach is to work with you and give you opportunities to "show me what you know," the pace of this course makes it very difficult to make up for missed or late work. If you have life events that get in the way of the work required for this course, it is your responsibility to be proactive and professional—contact me. There is no guarantee that work can be made up (especially lab work) if you miss it. In the end, the only thing I can promise is that late work will not receive full credit and, because collaboration is expected in class and lab, absence can affect the "Effort and Participation" portion of your grade.

Course Timeline:

This timeline is tentative and subject to change during the quarter.

Wk	Date	Topics	Chapters from Smil	Chapters from Knaflic
1	Sep. 27, 29	measuring energy	1	1

2	Oct. 2, 4, 6	energy in the biosphere	2	2
3	Oct. 9, 11, 13			3
4	Oct. 16, 18, 20	energy in human history	3	4
5	Oct. 23, 25, 27			5
6	Oct. 30, Nov. 1, 3	energy in the modern world	4	6
7	Nov. 6, 8, 10			7
8	Nov. 13, 15, 17	energy in everyday life	5	8
9	Nov. 20			9
10	Nov. 27, 29, Dec. 1	energy in the future	6	
11	Dec. 4, 6, 8			10
	Dec. 11, 8 a.m.	final exam		

Suggestions for Success:

- Expect to commit about 12-15 hours per week to this class, including class time. This is an average, and may not reflect your actual commitment each week. If you are spending twice as many hours, something is wrong and you should check in with your professor.
- Be organized. Check and double check on what is due when.
- Be active. Work on a few exercises each day. Look up unfamiliar terms and math concepts. Take notes. Make flash cards.
- Be proactive. Seek help early and often. Make use of the TLC and office hours. We want to help you!
- If you feel like you're going in circles and not figuring it out, take a break! You'll be surprised how often your mind will sort it out while you are doing something else.
- Form study groups. Ask questions of each other and email the professor if you still have questions.
- Be professional. Set high standards for yourself and the work you turn in. Work should be organized and clear. Show what you know!

Community Agreement

Each student and faculty member shares equally in the communal responsibility for how well this course works as a learning environment. All classes and activities on the UWT campus are about learning, which often involves the exchange of ideas. However, the tone and intention behind that exchange are important. Civility, politeness, reasonableness, and willingness to listen to others are expected at all times – even when passions run high. Behaviors must support learning, understanding, and scholarship. To this end, we agree that

both students and the professor will

- maintain an open, inquiring attitude toward the material.
- work to sustain an atmosphere of civility, goodwill, and mutual respect.
- be willing to admit ignorance, to experience discomfort, and to make honest mistakes.
- demonstrate commitment to and provide a supportive atmosphere for all members of this learning community.
- abide by the principles of the Social Contract and other Evergreen policies.
- attempt to resolve conflict and grievances fully and promptly first on an individual basis, then by seeking assistance from others if issues remain unresolved.
- treat this course as a part-time job based on the rough idea that 15-credits would be a full-time job requiring at least 40 hour per week.
- utilize on-the-job hours, including time in and out of class, to advance the goals of this learning community.

- maintain a sense of balance concerning the workloads and pace of teaching and learning and the other goals and demands of our lives.

the professor will

- facilitate the learning of students by collecting and presenting information, designing and conducting activities, and providing prompt feedback for students.
- be available for students during office hours and by appointment.
- return written assignments promptly, usually within a week of receipt; comment on assignments at student request.
- reflect on and make adjustments in the learning environment based on student input.

and students will

- attend all course activities, arrive on time, and be fully prepared to participate.
- notify the professor and group members if they are unable to attend due to illness or emergency.
- participate openly in the learning community to advance their own learning as well as contribute to the learning of others.
- take active responsibility for their actions and be aware of how their actions affect the learning environment of others.
- take initiative in seeking help from the professor and the various academic support services offered at Evergreen as needed.
- collaborate effectively with other students to produce group work that represents the talents and efforts of all members of the group.
- display academic integrity by submitting original work and giving appropriate credit for the contributions of others. (Please meet with the professor and consult the college's definition of plagiarism if you have any doubts about what is meant by academic integrity.)
- demonstrate professionalism by submitting clearly organized, appropriately formatted work that has been thoroughly proofread.
- tailor assignments to one's own interests and goals when the opportunity is offered.
- provide honest, thoughtful feedback to the professor and other course participants (including oneself) when asked.

Campus Policies, Expectations, and Support

There are several things you should know about UW-T. A comprehensive set of links is available at **www.tacoma.uw.edu/teaching-learning-technology/e-syllabus-campus-information-resources-policies-expectations (http://www.tacoma.uw.edu/teaching-learning-technology/e-syllabus-campus-information-resources-policies-expectations)** . Here is a subset of those links:

Grading System (**www.tacoma.uw.edu/catalog-17-18/undergraduate-academic-university-policies (http://www.tacoma.uw.edu/catalog-17-18/undergraduate-academic-university-policies)**): The UW Tacoma uses a numerical grading system. Instructors may report grades from 4.0 to 0.7 in 0.1 increments and the grade 0.0. The number 0.0 is assigned for failing work or unofficial withdrawal.

Academic Standards (**www.tacoma.uw.edu/catalog-17-18/academic-scholarship (http://www.tacoma.uw.edu/catalog-17-18/academic-scholarship)**): Students are expected to meet the traditional standards of honesty and truthfulness in all aspects of their academic work at UW Tacoma. In particular, all work submitted to an instructor in fulfillment of course assignments, including papers and projects, written and oral examinations, and oral presentations and reports, must be free of plagiarism.

In addition, in a course such as this where group work is encouraged, it is still the responsibility of each student to individually complete calculations and provide explanations for homework questions and lab activities. Any student who is uncertain whether his or her work is appropriate should consult the course instructor for guidance before formally submitting the work involved.

Quizzes and exams are opportunities to "show what you know." Anyone using resources not allowed during an exam will be asked to leave class that day and given a zero on that exam.

Email Policy (**www.tacoma.uw.edu/information-technology/email-policy-0 (http://www.tacoma.uw.edu/information-**

technology/email-policy-0)): University email communications will only be sent to their University of Washington email address. Faculty and staff are not obligated to respond to students using non-UW email accounts.

Information Technology Support (www.tacoma.uw.edu/information-technology/information-technology (http://www.tacoma.uw.edu/information-technology/information-technology)): From accounts and access through Canvas and Catalyst to video and wireless... support is available.

Teaching and Learning Center (www.tacoma.uw.edu/teaching-learning-center/ (http://www.tacoma.uw.edu/teaching-learning-center/)): The TLC provides free academic support for students at all levels. Consultants work collaboratively with students in writing, math, science and statistics, helping them to develop the skills, strategies, knowledge, and confidence necessary for academic success.

Library (www.tacoma.uw.edu/library/ (http://www.tacoma.uw.edu/library/)): Yes, we have one. Make use of it!

Other Support for Student Success (www.tacoma.uw.edu/office-vice-chancellor/student-success (http://www.tacoma.uw.edu/office-vice-chancellor/student-success)): There are links there for a variety of services available for students including the following:

- Student Counseling Center
- Student Health Services
- Disability Support Services
- Student Support Programs/Veterans and Military Programs

Campus Safety (www.tacoma.uw.edu/campus-safety/ (http://www.tacoma.uw.edu/campus-safety/)): Campus Safety Officers are available to walk you to your car or other campus destinations 24 hours a day, 7 days a week. Dial 253-692-4416 to request a Safety Escort.

You should sign up for UW Alert to receive notifications of emergencies or crisis situations that may disrupt the normal operation of the UW. Information about how to sign up and links to information about what to do in various emergency situations is available at www.tacoma.uw.edu/updates (http://www.tacoma.uw.edu/updates) .

Student Conduct (www.tacoma.uw.edu/catalog-17-18/student-rights-responsibilities (http://www.tacoma.uw.edu/catalog-17-18/student-rights-responsibilities)): There are standards of conduct to which all students are held, and you are responsible for being familiar with them. Essentially, they all reduce to respect: respect yourself, respect others, and respect this place; but check out the specifics.