AOM 2520 (3 credits)
Global Sustainable Energy: Past, Present and Future

Fall 2025 Distance course (Canvas), one hour per week mandatory meeting via web, Period 9, Monday 4:05pm-4:55pm ET, https://ufl.zoom.us/j/96424236665

Instructor: Dr. Dan Hofstetter, P.E.
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Catalog Description
Explore the global history of energy sources; investigate new energy sources and analyze international solutions to future needs.

Pre-requisites/Co-requisites:
None.

Course Objectives
This general education course will cover concepts of work and energy and their relationship with our modern society. Each aspect of this relationship with energy will be analyzed including consumptive patterns for the residential, commercial, and transportation sectors of our economy. Energy capacities and limitations for new sources of renewable energies will also be examined. All of these topics will be examined within a national and international context. A comparison between other countries and peoples will be an integral part of this course. At the end of this course, students will be able to:

1. Define concepts of work and energy and their relationship to human development.
2. Describe historical sources of energy, including human, animal, water, wind, and biomass.
3. Compare US energy consumption patterns to other countries.
4. Analyze national and international energy consumption patterns related to economic sectors such as transportation, residential commercial and agricultural.
5. Evaluate the role that energy efficiency can play in transforming consumptive patterns.
6. Construct a viable ten-year energy plan that will transform electricity production from predominantly fossil fuel based to renewable energy sources.
7. Construct a viable ten-year energy plan that will transform the US transportation system to a significantly more efficient and more renewable system.

Course Outline
1. Week 1/Mod 0: During drop/add students will work through tutorials designed to explain all of the new online tools and methods that are required for successful completion of this class.
2. Week 2/Mod 1: The basics of energy will be explored. Terms and units will be explained. The amount of energy people use each day, from a past and present perspective will be evaluated from both U.S. and global perspectives and the cultural and geographic factors leading to differences will be considered. Simple calculations will allow for a common comparison among various forms of energy.
3. Week 3/Mod 2: History of agriculture and food systems will be examined. The role of

mechanization and energy use and its effect on crop yields will be analyzed. Energy consumption for food systems will be presented.

4. Week 4/Mod 3: Transportation energy consumption will be analyzed. Major modes such as automobile, railroad and airplanes will be described. New technologies and their ability to transform this sector will be presented and debated.
5. Week 5/Mod 4: Energy in the built environment. The energy consumption related to residential and commercial spaces will be analyzed. Particular emphasis will be given to areas undergoing rapid change such as lighting, phantom loads, water heating, etc.
6. Week 6/Mod 5: Heat engines will be compared to direct conversion devices and what that means for the future.
7. Week 7/Mod 6: Renewable energy technologies will be presented along with appropriate capacity factors, growth rates, costs and cost trends
8. Week 8/Mod 7: Energy storage technologies will be presented along with appropriate capacity factors, growth rates, costs and cost trends.
9. Week 9/Mod 8: System efficiencies and disruptive technologies. The fallacy of Jevon's Paradox will be explained along with the ideas of tipping points and disruptive technologies like LED lights, electric cars and solar energy.
10. Week 10/Mod 9: Renewable energy and energy efficiency at the global scale. The current status of these technologies will be presented along with explanations of probable trends. Fallacies of linear projections will be discussed.
11. Weeks 11 and 12/Mod 10: Students will use knowledge gained in this class to produce a ten-year road map designed to transform our electrical power system from fossil fueled to renewable energy. Students will use participatory blogs to critique and support various scenarios.
12. Weeks 13 and 14/Mod 11: Students will use knowledge gained in this class to produce a ten-year road map designed to transform our liquid fuel transportation system from fossil fueled to renewable energy. Students will use participatory blogs and other online techniques to critique and support various scenarios.
13. Week 15: Class summary.

Course Schedule (dates are approximate)

Monday, August 25, 2025	**Zoom Meeting 1**	4pm to 5pm
	Quiz Course Contract	due by 11:59pm
	Discussion Topic Module 00 Current News & Events	due by 11:59pm
	Discussion Topic Module 00: Meet your Discussion Group	due by 11:59pm
	Quiz Quiz 0 (Q0)	due by 11:59pm
Sunday, August 31, 2025	Discussion Topic Module 1 Current News & Events	due by 11:59pm
	Discussion Topic Module 1: History of Energy Discussion	due by 11:59pm
	Quiz Quiz 1 (Q1)	due by 11:59pm

Monday, September 1, 2025	**Holiday**	
Sunday, September 7, 2025	Module 2 Current News & Events	due by 11:59pm
	Module 2: History of Agriculture Discussion	due by 11:59pm
	Quiz Quiz 2 (Q2)	due by 11:59pm
Monday, September 8, 2025	**Zoom Meeting 2**	4pm to 5pm
Sunday, September 14, 2025	Module 3 Current News & Events	due by 11:59pm
	Discussion Topic Module 3: Transportation Survey & Discussion	due by 11:59pm
	Quiz Quiz 3 (Q3)	due by 11:59pm
Monday, September 15, 2025	**Zoom Meeting 3**	4pm to 5pm
Sunday, September 21, 2025	Module 4 Current News & Events	due by 11:59pm
	Discussion Topic Module 4: Residential or Commercial Energy Project	due by 11:59pm
	Quiz Quiz 4 (Q4)	due by 11:59pm
Monday, September 22, 2025	**Zoom Meeting 4**	4pm to 5pm
Sunday, September 28, 2025	Module 5 Current News & Events	due by 11:59pm
	Discussion Topic Module 5: Heat Engines and Direct Conversion	due by 11:59pm
	Quiz Quiz 5 (Q5)	due by 11:59pm
Monday, September 29, 2025	**Zoom Meeting 5**	4pm to 5pm
Sunday, October 5, 2025	Module 6 Current News & Events	due by 11:59pm
	Discussion Topic Module 6: Renewable Energy Technologies	due by 11:59pm
	Quiz Quiz 6 (Q6)	due by 11:59pm
Monday, October 6, 2025	**Zoom Meeting 6**	4pm to 5pm
Sunday, October 12, 2025	Module 7 Current News & Events	due by 11:59pm
	Discussion Topic Module 7: Energy Storage	due by 11:59pm
	Quiz Quiz 7 (Q7)	due by 11:59pm

Monday, October 13, 2025	**Zoom Meeting 7**	4pm to 5pm
Sunday, October 19, 2025	Module 8 Current News & Events	due by 11:59pm
	Discussion Topic Module 8: System Efficiencies: Disruptive Technologies	due by 11:59pm
	Quiz Quiz 8 (Q8)	due by 11:59pm
Monday, October 20, 2025	**Zoom Meeting 8**	4pm to 5pm
Sunday, October 26, 2025	Module 9 Current News & Events	due by 11:59pm
	Discussion Topic Module 9: National Data: Renewable Energy	due by 11:59pm
	Quiz Quiz 9 (Q9)	due by 11:59pm
Monday, October 27, 2025	**Zoom Meeting 9**	4pm to 5pm
Sunday, November 2, 2025	Module 10 Week 1 Current News & Events	due by 11:59pm
	Discussion Topic Module 10: Transformations Discussion (Week 1 of Module 10)	due by 11:59pm
	Quiz Quiz 10 (Q10)	due by 11:59pm
Monday, November 3, 2025	**Zoom Meeting 10**	4pm to 5pm
Sunday, November 9, 2025	Extra Credit 1	due by 11:59pm
	Discussion Topic Module 10 Week 2 Current News & Events	due by 11:59pm
	Discussion Topic Module 10: Electricity Transformations: Renewable Energy (Week 2 of Module 10)	due by 11:59pm
	Quiz 11 (Q11)	due by 11:59pm
Monday, November 10, 2025	**Holiday**	
Sunday, November 16, 2025	Extra Credit 1B	due by 11:59pm
	Discussion Topic Module 11 Week 1 Current News & Events	due by 11:59pm
	Discussion Topic Module 11: Transformations Discussion (Week 1 of Module 11)	due by 11:59pm
	Quiz Quiz 12 (Q12)	due by 11:59pm
Monday, November 17, 2025	**Zoom Meeting 11**	4pm to 5pm

Monday, November 24, 2025	**Holiday Week Thanksgiving**	
Wednesday, December 3, 2025	Module 11 Week 2 Current News & Events	due by 11:59pm
	Discussion Topic Module 11: Transforming the National Transportation System Project (Week 2 of Module 11)	due by 11:59pm
	Quiz Quiz 13 (Q13)	due by 11:59pm
Monday, December 1, 2025	**Zoom Meeting 12**	4pm to 5pm
	Assignment Extra Credit 2: Energy and Climate Change	due by 11:59pm
Wednesday, December 3, 2025	Extra Credit 3	due by 11:59pm
	Discussion Topic Module 12 Current News and Events	due by 11:59pm
	Survey	due by 11:59pm

This syllabus is subject to change depending on student progress and scheduling.

There will be many new online tools that will help us manage the class and related coursework. We have a one hour Zoom session during **9th period every Monday** (except the first week and holidays). Zoom is a required online discussion tool that will allow us to communicate as a class, exchange ideas in real time and answer questions.

Discussion boards will be assigned every week (unless otherwise noted). Discussion Boards require an original post due Thursday night by 11:59pm (unless otherwise noted) and two responses to other posts by Sunday night by 11:59pm (also, unless otherwise noted). These responses should be approximately one paragraph in length. Responses such as: "I agree" or "Great!" are not acceptable. These are professional responses so remember to use polite, professional language, cite your sources and only post during the times allotted for each discussion.

Any difficulties with Zoom tools or procedures should be worked through the UF Helpdesk first. Do not wait until the last moment to log onto your Zoom session. There are typically no make-up sessions for the Zoom. There is a complete online training site for this with extensive helpdesk features. Time does not permit everything to be covered in the lectures therefore, reading and homework will be assigned. Every effort will be made to answer your emails within 24 hours during the normal work week.

Texts: None, numerous selected readings are included as links or attached texts on Canvas.

Grading

Current Events:	14 x 5 pts each	70 pts
Zoom:	12 x 5 pts	60 pts
Quizzes:	13 x 10 pts each	130 pts
Discussion:	8 x 10 pts each	80 pts
Residential Project:	40 pts	40 pts
Transportation Survey	20 pts	20 pts
Transformation Projects:	3 x 20 pts each	60 pts
Total points		460 pts

Each discussion group requires one original post by Thursday at (11:59) midnight with two additional posts due by Sunday (11:59) midnight. An acceptable original post is worth 6 points and the two responses are worth the remaining four points combined. Any exceptions will be noted. Grading criteria for the discussion groups will be included in the assignment description.

Projects are worth 15 to 40 points each and grading instructions are included in the information provided for that week.

460-432 pts	=	A
431-414	=	A-
413-400	=	B+
399-377	=	B
376-368	=	B-
367-354	=	C+
353-331	=	C
330-322	=	C-
321-308	=	D+
307-285	=	D
284-276	=	D-
<275	=	E

Projects and homework will be due on or before the date assigned in class. Late work will not be accepted without prior approval. A penalty of 10% per class period will be assessed for late assignments without approval. **Class participation is expected.**

Grades and Grade Points
For information on current UF policies for assigning grade points, see
https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

General Requirements

1. Many assignments, whether homework or group projects, will be due on a given date. Late assignments will lose points in grade for each day late. Missed exams may be rescheduled only with proper documented excuses within **one week** of the original date given.

2. There is no cumulative final exam.

3. Attendance and Make-Up Work: Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/.

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF. Please contact UMatterWeCare for additional and immediate support.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Privacy and Accessibility Policies

- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Zoom
  - Zoom Privacy Policy
  - Zoom Accessibility

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357