

NRES 341/541: Introduction to Sustainable Energy Policy

Fall, 2021

Classroom: TNR 170

Canvas link:

College of Natural Resources

3 credits

Tue & Thu. 11:00 am-12:15 pm

University of Wisconsin-Stevens Point

INSTRUCTOR

Nick Hylla

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Office hours: Virtually by appointment

COURSE DESCRIPTION AND OBJECTIVE

Ensuring sustainable energy for current and future generations is one of the greatest challenges that humankind faces today. The concern about availability of energy resources without compromising environmental and socio-economic capacities requires skilled and educated leaders who can navigate through institutional, economic, environmental, and technological dimensions of the energy issues. To make informed and responsible choices about our production and use of energy, it is essential to fully analyze the consequences of continued reliance on burning fossil carbon, inadequate renewable energy initiatives, the persistence of antiquated electric utility business models, and inefficient ways of using energy.

In this course, we will critically examine energy policy at the international, federal, state, and local levels and introduce tools for interdisciplinary and collaborative approaches to solve energy challenges. Students will become familiar with the breadth of energy-related problems at stake through development of methods, tools, and perspectives to analyze them. The class will review the types of energy used historically from fossil fuels to renewables energy alternatives, as well as the increasingly diverse possibilities for future energy use discussed in current policy debates. Coverage also includes a historical review and analysis of energy policies to move forward for a sustainable energy future. The field of energy policy and sustainability is inherently interdisciplinary, so the class draws on a set of tools and perspectives derived from multiple disciplines.

COURSE LEARNING OUTCOME

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

1. Critically analyze international, national, state, and local energy policy proposals using information from a diverse array of disciplines.
2. Formulate solutions to energy challenges by applying a sustainability framework that considers different energy resources, technologies, and business models.
3. Collaborate with a diverse group of peers to consolidate information, discuss issues, share perspectives, evaluate proposals, prioritize efforts, and develop recommendations.
4. Clearly and persuasively communicate ideas in writing and orally to formally engage peers in the discussion of energy issues.

READINGS AND OTHER COURSE MATERIALS

Required textbook:

***The Energy System: Technology, Economics, Markets, and Policy*, T. Bradford, 2018. MIT Press**

I will post any other required readings for each class with external links on *Canvas*. I will use lectures to emphasize the key concepts and theories, but I expect you to fully complete all readings. You should expect that concepts in the reading, even if not discussed in class, will appear on quizzes and tests.

EVALUATION

This course will rely upon a variety of evaluation methods to provide you an opportunity to synthesize the semester's work, and achieve the expected learning outcomes:

Assignments/Exams	Points	Due date
Quizzes/Reflection	50	Various
Short Assignments -Assignment 1 -Assignment 2	50 50	Thurs. Sep 16 in class Part 1 Tues. Oct. 5 Part 2 Tues. Oct. 12
Midterm exam	100	Thurs. Oct 14 in class
Group Assignment -Individual Report -Team presentation	100 50	Nov. 18 Week 14 and 15
Final exam	100	Dec. 14 time TBD
Total	500	

Final grades will be based on the percentage of the total 500 points that you earn on your assignments. The grading scale listed below indicates what percentages are required to earn a certain grade. The percentage decimal points will be rounded up to the closest number in the grading range. Grades will not be curved.

93-100 = A	87- 89 = B+	77-79 = C+	67-69 = D+
90- 92 = A-	83- 86 = B	73-76 = C	60-66 = D
	80-82 = B-	70-72 = C-	00-59 = F

I will post the grades and feedback in *Canvas* with each assignment so that you can track your progress as the course goes along. If at any point you have questions or concerns about your grade or any of your assignments, send me an email, I am happy to help!

ATTENDANCE

Attendance of class lectures and active participation in class discussion is required and your absence must be excused. An excused absence is defined as an absence for which you have provided me with written notice by email of your intent to be absent and the valid reason for the absence prior to the start of the lecture period for which you will be absent. Valid reasons for an excused absence include absences due to illness, compelling family needs, work demands, and job interviews. For any question or concern about your health and safety related to COVID-19, please check the info and resources at <https://www.uwsp.edu/coronavirus>

1. Quizzes (50 points)

There will be total 5 unannounced random quizzes or reflection questions at the beginning of classes throughout the semester. Each quiz will consist of 10 points and there will be no makeup

quizzes. Quizzes will test whether students have been keeping up on the required readings and following daily news from the Energy News Network. If you are late or absent in class without valid reason, you will miss the quiz and points.

2. Short Assignments (50+50= 100 points)

Assignment 1 (50 points): The class will be divided into teams, with each team consisting of 3-4 students. Each team will randomly interview approximately 6 students and 6 faculty/staff within the UWSP campus (each team member will conduct at least 3 interviews). We will develop the interview questions in class with the objective of assessing respondents' awareness of and perspective on energy production, energy use, and priority public policy issues. Each team will analyze interview responses and then share a brief presentation summarizing the key findings. I will provide you with more details regarding this assignment as the semester progresses.

Assignment 2 (50 points): This is an individual assignment. You must select a county (preferably where you grew up) and define the actions that the county office, major towns/cities, the incumbent utility, and surrounding state have implemented or have proposed/plan to implement to advance sustainable energy objectives. You will critically evaluate the energy plan/strategies using the sustainable energy framework we develop in class. You will write a short briefing paper (2 pages, single-space) targeting the county board members addressing the following issues:

- Summarize the plan/policy strategy by identifying the key factors/initiatives that might drive the progress or act as barriers towards energy sustainability.
- Recommend other actions the county can take to advance local sustainable energy development in the short and long term.

The briefing paper must be uploaded to *Canvas* by the due date. A copy of the briefing paper must also be shared with the respective county executive with an email copy to me.

3. Mid-term exam (100 points)

The midterm exam will be based on class lectures and reading materials. More specifics on the exam will be shared as class progresses.

4. Group Project assignment (150 points)

I will introduce this assignment and assign you to a group during the 4th week of class. This will be your team for the individual report assignment (100 points) and team presentation (50 points) towards the end of semester.

To give you some firsthand experience in identifying and analyzing energy policy and develop a portfolio of policy solutions to meet sustainable energy goals, your group must select Wisconsin and 3 or 4 other states from a given list and do a comparative analysis of energy policies and regulations (such as incentives, subsidies, rules, and mandates) as well as renewable energy initiatives. As a collaborative group work, each team member will focus on Wisconsin and one other assigned state. Then each team member will write an individual analytical paper focusing on energy data, policy findings, challenges, and recommendations. The paper should be submitted to *Canvas* dropbox by the due date. You will also send a copy of the individual analytical paper to your legislators at the state/federal level with an email copy to me. Then each group of students will work together and make a team presentation combining their findings and policy recommendations with the class.

If there is a problem with the group dynamics, it is imperative that you call it to my attention at the earliest possible time. If a member does not deliver tasks within the agreed timeframe, you should let me know well ahead of the deadline. If your group would like to meet with me for assistance on a group project, I will make myself available. If evidence of a free-riding problem (i.e. one or more group members not completing their share of the workload but sharing the benefits of the group) arises, we will attempt to address it at a group meeting. If the problem persists, the other members of the group, after consulting with me, may vote to exclude the free-rider from the group. In this event, the free-rider will receive 0 points for the whole or part of the project.

No Late Assignments are expected. To receive full credit, all assignments must be uploaded to the drop-box on the course *Canvas* site prior to the stated date (by midnight). Assignments turned in after the deadline will be considered late and will be subject to 10% per day late penalty. For example, a 100-point assignment that is two days late will, at most, be worth 80 points. Written work presented in an improper manner (see plagiarism discussion below) will result in you having to rewrite the assignment, and/or a reduction in points earned.

5. Final exam (100 points)

The final exam will be based on class lectures and reading materials covered throughout the semester with more emphasis on 2nd half of the semester. More specifics on the exam will be shared as class progresses.

ACADEMIC INTEGRITY

I do not tolerate plagiarism or cheating. Plagiarism of any type in your work is academic misconduct and unacceptable – consequences for plagiarism may range from an oral reprimand to expulsion from the University. Plagiarism is defined as deliberate or accidental use of ideas, research or words of another person without fully attributing them to their original sources. According to the *Merriam-Webster Online Dictionary*, to "plagiarize" means 1) to steal and pass off (the ideas or words of another) as one's own 2) to use (another's production) without crediting the source 3) to commit literary theft 4) to present as new and original an idea or product derived from an existing source. Obvious examples of plagiarism include turning in someone else's work as your own, cutting and pasting website text into a paper, or failing to properly cite another author's work. Less obvious forms of plagiarism involve paraphrasing the work of another author (or student) by simply rearranging a few words. All work must be your own. Do not copy or hand in the work of other students, authors, sources. When using other sources in your writing, be sure to credit those sources both within the text and at the end of your reports/papers. If you have any questions about what constitutes plagiarism, please review the resources available at <http://library.uwsp.edu/guides/vrd/plagiarism.htm> and talk with me.

All assignments submitted in *Canvas* are automatically linked to turnitin.com (software designed to detect plagiarism). If it appears to me that potential plagiarism or academic misconduct has occurred, I will initiate the disciplinary process outlined in Chapter 14 of the University of Wisconsin System Code. If the potential plagiarism or academic misconduct has occurred in relation to an individual or group project, I will initiate the disciplinary process for the specific student/ student group.

Tentative Class Schedule:

Date	Topics	Readings & Assignments
Week 1: Sep 2	Introduction and Course Overview Foundations of a Sustainable Energy Framework	<ul style="list-style-type: none"> • Welcome, introductions, course syllabus • Textbook Ch. 1 - The Energy System • Sign Up to Energy News Network daily updates for US and Midwest https://energynews.us/midwest/
Week 2: Sep 7 & 9	Energy Flows and Energy Markets Sustainable Energy Evaluation Framework	<ul style="list-style-type: none"> • Textbook Ch. 2 - Measuring and Valuing Energy • Textbook Ch. 3 - Improving the Energy System • Refine Sustainable Energy Framework to guide assignments and group project • Additional resources on Canvas <p>Develop Survey Questions for Assignment 1</p>
Week 3: Sep 14 & 16	Energy Regulation and Policy Tools Interview Findings	<ul style="list-style-type: none"> • Textbook Ch. 4 - Electricity and Grid Operation • Textbook Ch. 5 - Grid Economics • Additional resources on Canvas <p>Assignment 1: Group presentations on interview findings in class on Sept. 16th</p>
Week 4: Sep 21 & 23	The Electric Grid	<ul style="list-style-type: none"> • Textbook Ch. 6 - Coal, Oil, and Gas for Electricity • Textbook Ch. 7 - Hydropower and Nuclear Power • Additional resources on Canvas <p>Introduce Assignment 2</p>
Week 5: Sep 28 & 30	Traditional Baseload Power Sources	<ul style="list-style-type: none"> • Textbook Ch. 8 – Renewable Electricity • Textbook Ch. 9 – Electricity Demand Management • Additional resources on Canvas <p>Introduce Group Project</p>
Week 6: Oct 5 & 7	Renewable Electricity Demand Side Management	<ul style="list-style-type: none"> • Textbook Ch. 10 – Energy Storage • Textbook Ch. 11 – Distributed Generation • Additional resources on Canvas <p>Assignment 2, part 1: Upload county energy analysis to <i>Canvas</i> Oct. 5th by 5pm</p> <p>Assignment 2- part 2: Submit briefing paper to <i>Canvas</i> Oct. 12 by 5pm</p>
Week 7: Oct 12 & 14	Distributed Generation Energy Storage at Grid Scale and Consumer Scale	<ul style="list-style-type: none"> • Textbook Ch. 12 – Reintegrating the Electricity System • Textbook Ch. 13 – Transportation Services and Infrastructure • Additional resources on Canvas <p>Mid-term exam: Oct. 14</p>
Week 8: Oct 19 & 21	Adapting the Electric Utility Business Model Critical Energy Policy Considerations in the Midwestern US	<ul style="list-style-type: none"> • Textbook Ch. 14 – Oil • Textbook Ch. 15 - Biofuels • Additional resources on Canvas

Week 9: Oct. 26 & 28	Transportation Fuels Beneficial Electrification	<ul style="list-style-type: none"> • Textbook Ch. 16 – New Motors • Textbook Ch. 17 – Thermal Demand and Supply • Additional resources on Canvas
Week 10: Nov 2 & 4	Community Approaches to Sustainable Energy Development UWSP Campus Energy Initiatives	<ul style="list-style-type: none"> • Textbook Ch. 18 – Natural Gas • Textbook Ch. 19 – Economic System Interactions • UWSP Sustainability annual report • Additional resources on Canvas
Week 11: Nov 9 & 11	US Natural Gas Industry Energy Economics	<ul style="list-style-type: none"> • Textbook Ch. 20 – Ecosystem Interactions • Additional resources on Canvas
Week 12: Nov 16 & 18	Energy Externalities and Policy Interventions Q&A with Guest Energy Panel	<ul style="list-style-type: none"> • Additional resources on Canvas <p>Submit individual report in Canvas and send to your legislator</p>
Week 13: Nov 23	Group Work on Presentation Thanksgiving (no class on Thursday)	In class time to work on presentations with feedback from guest panel of energy professionals.
Week 14: Nov 30 & Dec 2	Discussion Group presentations	<p>All teams submit presentations in Canvas by 5pm on Tues. Nov. 30</p> <p>Group presentations begin on Thurs. Dec 2nd</p>
Week 15: Dec 7 & 9	Group presentations Wrap up and reflections	
Finals Week	Final Exam, Dec. 14 Tue., Time TBD	

Primary Resources:

- EIA Annual Energy Outlook <https://www.eia.gov/outlooks/aeo/>
- NREL Energy Analysis <https://www.nrel.gov/analysis/index.html>
- US Energy Flow Charts <https://flowcharts.llnl.gov/>
- US DOE <https://www.energy.gov/eere/office-energy-efficiency-renewable-energy>
- RAP <https://www.raponline.org>
- DSIRE <https://www.dsireusa.org>
- Clean Energy States Alliance <https://www.cesa.org>

News and Opinion

- The Energy News Network <https://energynews.us>
- Canary Media <https://www.canarymedia.com>
- The Energy Gang <https://www.greentechmedia.com/podcast/the-energy-gang>
- Rise Up Midwest <https://riseupmidwest.org/podcast>
- Institute for Local Self Reliance <https://ilsr.org/energy>