

**University of Toronto Scarborough  
Department of Physical and Environmental Sciences**

**ESTC37 Energy and Sustainability**

**Fall 2023**

**Professor Laura Tozer** [laura.tozer@utoronto.ca](mailto:laura.tozer@utoronto.ca)

**Time and Location:** Thursday, 1:00 PM - 4:00 PM, BV 361

**Office hours:** Tuesday or Thursdays 12-1 by appointment only, EV 343

**COURSE DETAILS**

**Course description:**

This course will address energy systems and policy, focusing on opportunities and constraints for sustainable energy transitions in Canada and the Global North. The first part of the course introduces energy systems, including how energy is used in society, decarbonization pathways for energy, and the social and political challenges of transitioning to zero carbon and resilient energy systems. The second part of the course covers a series of case studies about energy transitions and sustainability in Canada, the US, Japan, Norway and Germany. Through these case studies, we will learn about energy sources, end uses, technologies, institutions, politics, policy tools and the social and ecological impacts of energy. Students will learn about a range of approaches for energy systems analysis and gain skills in imagining and planning sustainable energy futures.

**Objectives:**

By the end of this course, students will be able to:

- Describe basic concepts related to energy sources, energy end use, and energy technology
- Describe key components of Canadian energy policy and institutions
- Describe the challenges and opportunities for sustainable energy transitions
- Analyze the interaction of technical, policy, and social aspects of energy systems
- Evaluate the sustainability of energy systems and energy technologies
- Communicate complex concepts concisely

**The University's Statement of Acknowledgement of Traditional Land**

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron- Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

## EVALUATION AND ASSIGNMENTS

Assignment	Weight	Deadline
<b>Weekly Reading Responses:</b> Week 2-11 (grade based on the best 6/10)	40%	Weekly by 9 am Thursdays
<b>Assignment 1:</b> En-Roads Energy Futures Modelling Report	15%	October 19 11:59 pm
<b>Assignment 2:</b> Talking about Energy Video	20%	November 9 11:59 pm
<b>Assignment 3:</b> Fossil Free Canada Travel Guide Entry and Presentation	25%	November 30 11:59 pm

Detailed requirements for assignments will be shared in class and posted on the Quercus website for this course. See the details about course and departmental policies later in this syllabus for details about late submission penalties.

## COURSE FORMAT AND SHARED POLICIES

Classes are two-hours long and will include lectures, discussions, activities, and workshops. There is a course website on Quercus for announcements, readings, and course materials. Changes to the readings or course schedule may happen throughout the semester. The Quercus website is the most up-to-date source for course topics and requirements. Any changes will be announced in advance so you know what to do. Please be sure to check the course site frequently. Learning in this course requires completing the readings, attending lectures, and engaging in class discussion and exercises. You must complete the readings each week before class. In class, students are expected to contribute to in-class discussions and activities. You will be called on from time to time to contribute your thoughts on a reading to group discussions. You are expected to contribute in thoughtful and constructive ways. Participation will be assessed through contributions during class (a range of participation formats are available and welcome in this course) and through a weekly reflection journal.

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

**Please see additional course and departmental policies in the syllabus below.**

**COURSE SCHEDULE (subject to revisions)**

Date	Activities	Assignment Due Dates
Week 1 Sept 7	Energy system transitions Sustainable energy as a social and political challenge	
Week 2 Sept 14	Energy futures Energy systems modelling and analysis	
Week 3 Sept 21	Field Trip #1	
Week 4 Sept 28	Case Study: Germany Energiewende <ul style="list-style-type: none"> <li>• Policy innovation to transition to renewable energy</li> <li>• Solar energy</li> <li>• Transitioning away from coal and nuclear</li> <li>• Managing an electricity grid: flexibility and stability</li> </ul> <b>Tutorial 1: Assignment 1</b>	
Week 5 Oct 5	Case Study: Oil pipelines in North America: <ul style="list-style-type: none"> <li>• Addressing fossil fuel production</li> <li>• Energy institutions and politics</li> <li>• Social movements and acceptance</li> <li>• Carbon capture and storage</li> <li>• Policy tools and geopolitics</li> </ul> <b>Tutorial: Assignment 2</b>	
Oct 12	READING WEEK	
Week 6 Oct 19	Case Study: Energy efficiency, energy poverty, and buildings in Toronto <ul style="list-style-type: none"> <li>• Energy efficiency for sustainability transitions</li> <li>• Technology, policy and practices for zero carbon buildings and communities</li> </ul>	<i>Assignment 1 due</i>

	<ul style="list-style-type: none"> <li>• Building integrated electricity generation and district energy</li> <li>• Energy poverty</li> </ul> <p><b>Tutorial: Assignment 2</b></p>	
Week 7 Oct 26	<p>Case Study: Indigenous and community owned renewable energy in Canada</p> <ul style="list-style-type: none"> <li>• Reconciliation, sovereignty and renewable energy</li> <li>• Remote communities and the transition to renewable energy</li> <li>• Community ownership and political dynamics</li> <li>• Wind energy</li> </ul>	
Week 8 Nov 2	<p>Guest lecture</p> <p><b>Tutorial: Assignment 2</b></p>	
Week 9 Nov 9	<p>Field trip #2</p>	<i>Assignment 2 due</i>
Week 10 Nov 16	<p>Case Study: Norway and electric vehicles</p> <ul style="list-style-type: none"> <li>• Policy innovation for electrification of transport</li> <li>• Building electric vehicle infrastructure</li> <li>• Social adoption and behaviour</li> <li>• Transportation as part of an integrated energy system</li> </ul> <p><b>Tutorial: Assignment 3</b></p>	
Week 11 Nov 23	<p>Fossil Free Canada Workshop</p>	
Week 12 Nov 30	<p>Presentations</p>	<i>Assignment 3 due</i>

## POLICIES AND EXPECTATIONS

## Handing in Your Assignments:

All assignments for this course must be submitted through **Quercus**. Paper copies of the assignments will not be accepted.

## Extensions

Students must request an extension in ADVANCE of the deadline in order to receive a decision. Extensions beyond the examination period must be submitted via petition through the Office of the Registrar. Please follow the University of Toronto procedure to be completed in order to be considered for academic accommodation for any course work such as missed tests or late assignments.

## Illness

Students who are absent from academic participation for **any reason** (e.g., COVID, cold, flu and other illness or injury, family situation) and who require consideration for missed academic work should report their absence using the online absence declaration on **ACORN** and on the [DPES](#) online form. The declaration is available on **ACORN under the Profile and Settings menu**. Students should also advise their instructor of their absence via the [DPES](#) online form.

## Missed Term Work

Late assignments will be **subject to a late penalty of 2% per day (including weekends) of the total marks for the assignment**. Late assignments will only be accepted for one week after the deadline. The only exemption from these penalties will be for work that is late for health reasons, as long as students submit proper documentation as required by University of Toronto procedure.

## Email and Communication

I hold weekly office hours and I would be happy to meet with you during these times. You can also reach me by email, but please consider the following things:

- You are expected to write from your University of Toronto email
- Please come to my office hours for substantive discussions
- I will do my best to respond, but I don't respond to emails on evenings or weekends and may not be able to respond rapidly at all times.

## Assistance and Accommodation

There are many resources for students who need assistance, including academic resources and health and counselling services. The University also is committed to providing allowances for religious observances. If you need accommodation for any reason, please let me know. Here are a few resources you may find useful:

- <http://life.utoronto.ca/just-for-you/for-students-with-a-disability/>
- <http://www.accessibility.utoronto.ca/>
- <http://healthandwellness.utoronto.ca/>
- <http://www.writing.utoronto.ca/writing-centres>

- <http://uoft.me/religiousaccommodation>
- <https://www.sgs.utoronto.ca/gradlife/Pages/Grad-Wellness.aspx>
- <https://www.sgs.utoronto.ca/currentstudents/Pages/Writing-Centre.aspx>

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible.

AccessAbility Services staff (located in Rm AA142, Arts and Administration Building) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email [ability.utsc@utoronto.ca](mailto:ability.utsc@utoronto.ca). The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

### **Writing Support**

Please see English Language and writing support at University of Toronto: <http://www.sgs.utoronto.ca/currentstudents/Pages/English-Language-and-Writing-Support.aspx>

### **Plagiarism and Academic Integrity**

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The [University of Toronto's Code of Behaviour on Academic Matters](#) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

#### In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor in all relevant courses
- Making up sources or facts
- Obtaining or providing unauthorized assistance on any assignment

#### On tests and exams:

- Using or possessing unauthorized aids
- Looking at someone else's answers during an exam or test
- Misrepresenting your identity

#### In academic work:

- Falsifying institutional documents or grades
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes

All suspected cases of academic dishonesty will be investigated following procedures outlined in the *Code of Behaviour on Academic Matters*. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources (for example, the [University of Toronto website on Academic Integrity](#)).

### **Use of Generative AI in Assignments**

- Students may use artificial intelligence tools for creating an outline for an assignment, but the final submitted assignment must be original work produced by the individual student alone.
- Students may not use artificial intelligence tools for completing major course assignments. However, these tools may be useful when gathering information from across sources and assimilating it for understanding.