

MIE1120H: Current Energy Infrastructure and Resources Winter 2024

Instructor:

David Sinton | dave.sinton@utoronto.ca
Office: MC226

Teaching Assistants:

Rui Miao | ruikai.miao@mail.utoronto.ca
Sepehr Saber | sepehr.saber@mail.utoronto.ca
Sonia Sun | siyu.sun@mail.utoronto.ca

Lectures:

Time: **Mondays 1:10 - 3:00 pm** (starting January 8)
Location: **BA1190**

Course Description:

This course covers the basic principles of how global energy is currently supplied, by primary source. The aim is to provide an energy literacy that can inform research, technology development and effective policy in this area. The course content will be roughly divided according to the current global energy mix (i.e. 32% oil, 27% coal, 23% gas, 6.7% hydro, 4.0% nuclear, 3.4% wind, 2.1% solar, and 1.2% geothermal/biomass/biofuels). In each case we will focus on: (a) the characteristics of the resource; (b) the infrastructure for extraction/development of the resource; (c) the usage of the resulting energy; and (d) the implications of usage. Assignments and exams will assess both background knowledge and the ability to apply fluid flow, thermodynamic and heat transfer analyses to energy supply systems.

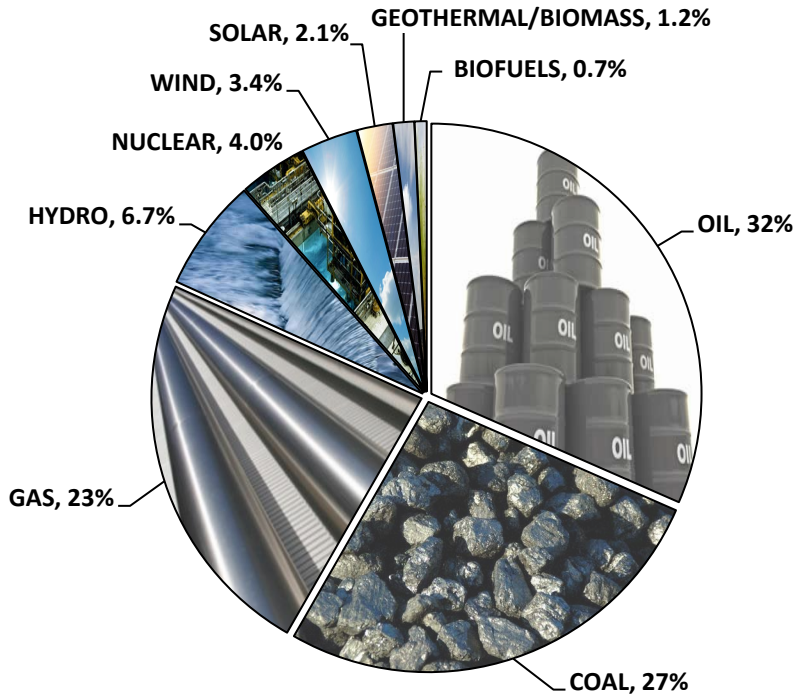
Evaluation - format and timing to be confirmed:

Assignment 1:	15%
Midterm:	30%
Assignment 2:	15%
Exam:	40%

Schedule - To be confirmed -

1:10 Mon	Jan 8	Introduction	
1:10 Mon	Jan 15	Geothermal, Solar, Wind	
1:10 Mon	Jan 22	Nuclear, Hydro	
1:10 Mon	Jan 29	Nuclear, Hydro, Natural Gas	Assignment 1 distributed in class
1:10 Mon	Feb 5	Natural Gas	
1:10 Mon	Feb 12	Coal a+b	Assignment 1 due at <i>start</i> of class
----- <i>Reading Week</i> -----			
1:10 Mon	Feb 26	MIDTERM	
1:10 Mon	Mar 4	Coal c+d	
1:10 Mon	Mar 11	Oil a+b	Assignment 2 distributed in class
1:10 Mon	Mar 18	Oil c+d	
1:10 Mon	Mar 25	Oil c+d	Assignment 2 due at <i>start</i> of class
1:10 Mon	Apr 1	Buffer & Review	
1:10 Mon	Apr 8	EXAM	

World Energy Consumption by Primary Source [EI Statistical Review of World Energy – 2023]:



Inclusivity Statement:

You belong here. The University of Toronto Engineering commits to all students, instructors, staff, alumni and partners that you can learn, create and participate in a welcoming, healthy and respectful environment. In this class, the participation and perspectives of everyone is invited and encouraged. The broad range of identities and intersections of identities within an inclusive team environment will help you achieve academic success. You can read the evidence for this approach here:

<https://www.weforum.org/agenda/2019/04/business-case-for-diversity-in-the-workplace/>.

You are not alone. You are invited to talk to anyone in the Faculty that you feel comfortable approaching, including your professor, teaching assistant, academic advisor, any staff member, the Engineering Equity Diversity & Inclusion Action Group, a culture or identity club or group, or a U of T Equity Office.

Department Administrators: <https://gradstudies.engineering.utoronto.ca/grad-admins/>

Engineering Equity, Diversity & Inclusion Action Group & Clubs: www.uofteng.ca/edi

U of T Equity Offices: <https://hrandequity.utoronto.ca/inclusion/equity-offices/>

You have rights under the Ontario Human Rights Code that protect you against all forms of harassment or discrimination, including but not limited to acts of racism, sexism, Islamophobia, anti-Semitism, homophobia, transphobia, ableism and ageism. Engineering denounces unprofessionalism or intolerance of any kind, whether in person or online, on or off-campus. If you experience or witness any of these behaviours, please tell someone so we can help with resources and resolution. Engineering takes these reports extremely seriously. You can confidentially disclose directly to Marisa Sterling, P.Eng, Assistant Dean, Diversity, Inclusion and Professionalism.

Phone: 416.946.3986

Email: disclosure.engineering@utoronto.ca

Submit confidential disclosure form: www.uofteng.ca/disclosure

Ontario Human Rights Code: <http://www.ohrc.on.ca/en/students%E2%80%99-handouts/fact-sheet-1-ontario-human-rights-code>

Accommodations:

The University of Toronto supports accommodations for students with diverse learning needs, which may be associated with mental health conditions, learning disabilities, autism spectrum, ADHD, mobility impairments, functional/fine motor impairments, concussion or head injury, visual impairments, chronic health conditions, addictions, D/deaf, deafened or hard of hearing, communication disorders and/or temporary disabilities, such as fractures and severe sprains, or recovery from an operation.

If you have a learning need requiring an accommodation the University of Toronto recommends that students register with Accessibility Services as soon as possible. Register at:

<https://studentlife.utoronto.ca/service/accessibility-services-registration-and-documentation-requirements/>

We know that many students avoid seeking help because they feel that they should not need “unfair advantages.” The purpose of academic accommodation is not to give an unfair advantage, but to help

remove an unfair disadvantage. It may feel difficult to ask for help, but it can make all the difference during your time here.

Phone: 416-978-8060

Email: accessibility.services@utoronto.ca

Mental Health:

Engineering at the University of Toronto is a demanding program. The workload and the frequency of assignments and tests can be challenging to balance and can feel overwhelming. As a result, students can find themselves experiencing physical and/or mental health issues which impact their academic performance and overall well-being.

If you find yourself feeling distressed and in need of more immediate support resources, consider reaching out to the counsellors at **My Student Support Program (MySSP)** (www.uoft.me/myssp) or visiting **U of T Engineering's Urgent Support – Talk to Someone Right Now** webpage (<https://uofteng.ca/talknow>).

If you are encountering challenges that significantly affect your academic performance and overall wellbeing, there are a variety of free and confidential supports that can help you. As a U of T Engineering student, you have your **Departmental Graduate Administrator** (www.uoft.me/gradadmin) who can advise on personal matters that impact your academics. You can find helpful people, services and resources like these listed on the **U of T Engineering Mental Health & Wellness webpage** (www.uofteng.ca/mentalhealth) and SGS Health and Wellness Resources (<https://www.sgs.utoronto.ca/gradhub/resources-supports/#health-wellness>)

A small selection is also included here:

- Accessibility Services (www.studentlife.utoronto.ca/as)
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- Health & Wellness (www.healthandwellness.utoronto.ca)
 - On-Location Health & Wellness Engineering Counsellor (<https://www.sgs.utoronto.ca/resources-supports/graduate-wellness-services-at-sgs/>)
- Student Life Academic Success (<https://studentlife.utoronto.ca/department/academic-success/>)
- U of T Engineering's Mental Health Programs Officer (www.uofteng.ca/mentalhealth#MHPO)
- SGS Financial Aid (<https://www.sgs.utoronto.ca/awards-funding/financial-aid-advising/>)

We encourage you to access these resources as soon as you feel you need support.