

# MIE1120H: Current Energy Infrastructure and Resources Winter 2022

## Instructor:

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## Teaching Assistants:

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## Lectures:

Time: **Mondays 1:10 - 3:00 pm** (starting January 10)  
Location: **GB120**. However we will start the term online at the link below, and switch to in-person learning in GB120 when permitted.

<https://us02web.zoom.us/j/82928763069?pwd=OG02eldPbVpEQgzOWJhZm5aTEh1dz09>  
Meeting ID: 829 2876 3069  
Passcode: 112022

## 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. 31% oil, 27% coal, 25% gas, 6.9% hydro, 4.3% nuclear, 2.5% wind, 1.4% solar, and 1.8% geothermal/biomass/biofuels). In each case background reading and critical analyses will be applied to: (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%

## Resources:

Will be updated week by week, including mostly research papers, videos, and news articles. Below is an initial list of quality resources available online.

- BP – [Statistical Review of World Energy 2021](#)

- BP – [World Energy Data 2021](#)
- IEA – [Data and statistics](#)
- MacKay, D.J.C., “Sustainable Energy Without the Hot Air”, Cambridge 2008. Also available free online: [www.withouthotair.com](http://www.withouthotair.com) 10-page synopsis:  
<http://www.withouthotair.com/synopsis10.pdf>

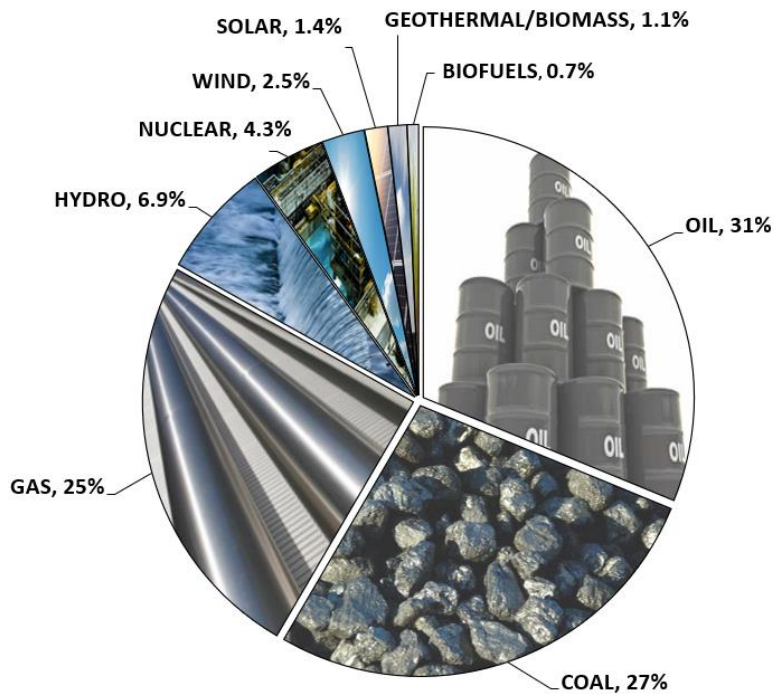
**Schedule - To be confirmed -**

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1:10 Mon	Jan 10	Introduction	
1:10 Mon	Jan 17	Geothermal, Solar, Wind	
1:10 Mon	Jan 24	Nuclear, Hydro	
1:10 Mon	Jan 31	Nuclear, Hydro, Natural Gas	Assignment 1 distributed in class
1:10 Mon	Feb 7	Natural Gas	
1:10 Mon	Feb 14	Coal a+b	Assignment 1 due at <i>start</i> of class
----- Reading Week -----			
1:10 Mon	Feb 28	<b>MIDTERM</b>	<b>TBC</b>
1:10 Mon	Mar 7	Coal c+d	
1:10 Mon	Mar 14	Oil a+b	Assignment 2 distributed in class
1:10 Mon	Mar 21	Oil c+d	
1:10 Mon	Mar 28	Oil c+d	Assignment 2 due at <i>start</i> of class
1:10 Mon	Apr 4	Review	
		<b>EXAM</b>	<b>TBC</b>

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**World Energy Consumption by Primary Source [BP Statistical Review of World Energy – 2021]:**



**Inclusivity Statement:**

All students and faculty at the University of Toronto have a right to learn, work and create in a welcoming, respectful, inclusive and safe environment. In this class we are all responsible for our language, action and interactions. Discriminatory comments or actions of any kind will not be permitted. This includes but is not limited to acts of racism, sexism, Islamophobia, anti-Semitism, homophobia, transphobia, and ableism. As a class we will work together to create an inclusive learning environment and support each other's learning.

If you experience or witness any form of discrimination, please reach out to the Engineering Equity Diversity & Inclusion Action Group [online](#), an [academic advisor](#), a [U of T Equity Office](#), or any U of T Engineering faculty or staff member that you feel comfortable approaching.

**Accommodations:**

If you have a learning need requiring an accommodation the University of Toronto recommends that students immediately register at Accessibility Services at [www.studentlife.utoronto.ca/as](http://www.studentlife.utoronto.ca/as).

Location: 4th floor of 455 Spadina Avenue, Suite 400

Voice: 416-978-8060

Fax: 416-978-5729

Email: [accessibility.services@utoronto.ca](mailto:accessibility.services@utoronto.ca)

The University of Toronto supports accommodations of students with special learning needs, which may be associated with learning disabilities, mobility impairments, functional/fine motor disabilities, acquired brain injuries, blindness and low vision, chronic health conditions, addictions, deafness and hearing loss, psychiatric disabilities, communication disorders and/or temporary disabilities, such as fractures and severe sprains, recovery from an operation, serious infections or pregnancy complications.

**Mental Health:**

As a university student, you may experience a range of health and/or mental health issues that may result in significant barriers to achieving your personal and academic goals. The University of Toronto offers a wide range of free and confidential services and programs that may be able to assist you. We encourage you to seek out these resources early and often.

Health & Wellness Resources: [undergrad.engineering.utoronto.ca/advising-and-wellness/health-wellness/](http://undergrad.engineering.utoronto.ca/advising-and-wellness/health-wellness/)

U of T Health & Wellness Website: [studentlife.utoronto.ca/hwc](http://studentlife.utoronto.ca/hwc)

If, at some point during the year, you find yourself feeling distressed and in need of more immediate support, visit the **Feeling Distressed Webpage**: [www.studentlife.utoronto.ca/feeling-distressed](http://www.studentlife.utoronto.ca/feeling-distressed), for more campus resources.

Off campus, immediate help is available 24/7 through **Good2Talk**, a post-secondary student helpline at 1-866-925-5454.

All students in the Faculty of Engineering have an Academic Advisor who can advise on academic and personal matters. You can find your department's Academic Advisor here: [uoft.me/engadvising](http://uoft.me/engadvising)