

MIE1120H: Current Energy Infrastructure and Resources

Winter 2020

Instructor:

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Teaching Assistants:

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Lectures:

Thursdays: 12:10-15:00 in RS208, starting January 9

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. 34% oil, 27% coal, 24% gas, 7% hydro, 4% Nuclear, 4% Other). 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:

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

Resources:

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

- BP – [Statistical Review of World Energy 2018](#)
- IEA – [Data and statistics](#)
- MacKay, D.J.C., “Sustainable Energy Without the Hot Air”, Cambridge 2008. Also available free online: www.withouthotair.com 10-page synopsis:
<http://www.withouthotair.com/synopsis10.pdf>

Preliminary Schedule of Topics:

12:10 Thurs	Jan 9	Introduction/Outline	RS208	
12:10 Thurs	Jan 16	Geothermal, Solar, Wind	RS208	
12:10 Thurs	Jan 23	Nuclear, Hydro	RS208	
12:10 Thurs	Jan 30	Nuclear Industry Talk	RS208	Assignment 1 distributed in class
12:10 Thurs	Feb 6	Natural Gas	RS208	
12:10 Thurs	Feb 13	Coal a+b	RS208	Assignment 1 due at <i>start</i> of class
----- Reading Week -----				
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12:10 Thurs	Feb 27	MIDTERM	TBD	
12:10 Thurs	Mar 5	Coal c+d	RS208	
12:10 Thurs	Mar 12	Oil a+b	RS208	Assignment 2 distributed in class
12:10 Thurs	Mar 19	Oil c+d	RS208	
12:10 Thurs	Mar 26	Oil Industry Talk	RS208	Assignment 2 due at <i>start</i> of class
12:10 Thurs	Apr 2	Review	RS208	
12:10 Thurs	Apr 9	EXAM	TBD	

World Energy Consumption:

