

ENG PHYS 3ES3
Introduction to Energy Systems
 Fall 2016
 Course Outline

CALENDAR/COURSE DESCRIPTION

A survey course on energy systems with emphasis on the analytic tools needed to evaluate them in terms of performance, resources and environmental sustainability, costs, and other relevant factors over their life cycles.

We will examine the science, technology and human factors that interact in energy systems. Energy technologies (including resources, production, consumption, conversion, storage and transportation) will be analyzed in a global context including their societal and environmental impacts. Issues related to long term sustainability and sustainable development will be evaluated for current and proposed energy systems. Innovations in energy technologies and systems will also be discussed.

PRE-REQUISITES AND ANTI-REQUISITES

Prerequisite(s): Registration in an Engineering Physics program, or level IV or V of a Civil Engineering Program or permission of the instructor.

Antirequisite(s): None, but there is significant overlap with MECH ENG 4004 and CHEM ENG 4A03

INSTRUCTOR OFFICE HOURS AND CONTACT INFORMATION

Rafael Kleiman
 JHE A324
kleiman@mcmaster.ca
 ext. 26290

Office Hours:

By appointment

TEACHING ASSISTANT OFFICE HOURS AND CONTACT INFORMATION

Name	Email	Office	Office Hours
Ahmed Ganzory	ganzora@mcmaster.ca	BSB B204	Fri. 10:30-12:30
Andrey Goussev	goussev@mcmaster.ca	ABB 250A	Thurs. 10:30-12:30
Sara Makaremi	makares@mcmaster.ca	ABB 337	Tues. 12:30-2:30
Frédéric Salaun	salaunf@mcmaster.ca	ETB 529	Tues. 10:30-12:30
Chaoyue Wang	wangc1@mcmaster.ca	ETB 303	Wed. 10:30-12:30

COURSE WEBSITE/ALTERNATE METHODS OF COMMUNICATION

<http://engphys.mcmaster.ca/undergrad-studies/ug-courses/eng-phys-3es3/>
<http://avenue.mcmaster.ca/>

COURSE OBJECTIVES

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

- Analyze the relevant factors and their interplay in energy systems, including technological and human factors.
- Analyze the carbon footprint and sustainability of an energy technology
- Assimilate new information independently regarding energy systems

MATERIALS AND FEES

Recommended Reading:

Title Sustainable Energy: Choosing Among Options
 Authors Jefferson W. Tester, Elisabeth M. Drake, Michael J. Driscoll, Michael W. Golay, William A. Peters
 Edition 2nd
 Publisher MIT Press, 2012
 ISBN 0262304635, 9780262304634
 Length 1056 pages

Other required or recommended resources used during the course will be posted on Avenue to Learn.

Required Texts: None.

Calculator: None.

Other Materials: None.

COURSE OVERVIEW

Date/Week	Topic	Resource for questions
Wednesday, September 14, 2016	Assignment 1 due	Chaoyue Wang
Wednesday, September 21, 2016	Assignment 2 due	Sara Makaremi
Wednesday, September 28, 2016	Assignment 3 due	Ahmed Ganzory
Wednesday, October 05, 2016	Assignment 4 due	Andrey Goussev
Wednesday, October 19, 2016	Report/TED topics due	Frédéric Salaun
Wednesday, October 26, 2016	Assignment 5 due	Sara Makaremi
Wednesday, November 02, 2016	Assignment 6 due	Andrey Goussev
Wednesday, November 09, 2016	Assignment 7 due	Ahmed Ganzory
Wednesday, November 16, 2016	Assignment 8 due	Chaoyue Wang
Wednesday, November 30, 2016	Written Report due	Sara Makaremi and Chaoyue Wang
Wednesday, December 07, 2016	TED Talk due	Ahmed Ganzory and Andrey Goussev
Wednesday, December 07, 2016	Reading Log due	Rafael Kleiman

All submissions must be made via Avenue to Learn.

ASSESSMENT

Component	Weight	Notes
Attendance (31/37 classes for full marks)	15%	Grade prorated for less than 31 classes
Assignments (8)	35%	No extensions
Written Report and TED Talk outlines, due October 19, 2016	0%	-5% for each if not submitted by due date
Written Report, due November 30, 2016	25%	-1%/day through December 8, not accepted after that
TED Talk, due December 07, 2016	15%	-5% on December 8, not accepted after that
Reading Log, due December 07, 2016	10%	-5% on December 8, not accepted after that
Total	100%	

ACCREDITATION LEARNING OUTCOMES

The Learning Outcomes defined in this section are measured for Accreditation purposes only, and will not be directly taken into consideration in determining a student's actual grade in the course.

Outcomes	Indicators
1. Can demonstrate competence in physics, chemistry and mathematics which relates to systems, economics, and sustainability analysis in energy systems.	1.2
2. Can demonstrate competence in engineering which relates to systems, economics, and sustainability analysis in energy systems	1.3
3. Can demonstrate an ability to draw substantiated conclusions logically using appropriate knowledge and skills, and to discuss the limitations of the solutions.	2.3
4. Can demonstrate an ability to use tools related to energy systems, economics, policy and climate change analysis, and to use tools related to social scientific literacy.	5.2
5. Can demonstrate an ability to identify the interaction between engineering and society, and to address uncertainties in predictions in a structured and transparent manner.	9.2
6. Can demonstrate an ability to assess the options from a sustainability engineering perspective, which emphasizes environmental stewardship and long-term decision-making.	9.3
7. Can demonstrate an ability to define stakeholders, and show how to interact with stakeholders in an energy systems context.	13.3
8. Can demonstrate an ability to define and discuss what the ethics and responsibility of engineers are in an energy systems context.	13.4
9. Can demonstrate an ability to draw politically reasonable, economically feasible, technologically sound, socially acceptable, environmentally fruitful conclusions which are completely supported by solid evidence.	13.5

For more information on Accreditation, please visit: <https://www.engineerscanada.ca>

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at <http://www.mcmaster.ca/academicintegrity>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

ACADEMIC ACCOMMODATIONS

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contact by phone at 905.525.9140 ext. 28652 or e-mail at sas@mcmaster.ca. For further information, consult McMaster University's Policy for [Academic Accommodation of Students with Disabilities](#).

NOTIFICATION OF STUDENT ABSENCE AND SUBMISSION OF REQUEST FOR RELIEF FOR MISSED ACADEMIC WORK

1. The [McMaster Student Absence Form](#) is a self-reporting tool for Undergraduate Students to report absences DUE TO MINOR MEDICAL SITUATIONS that last up to 3 days and provides the ability to request accommodation for any missed academic work. Please note, this tool cannot be used during any final examination period.
2. You may submit a maximum of 1 Academic Work Missed request per term. It is YOUR responsibility to follow up with your Instructor immediately (NORMALLY WITHIN TWO WORKING DAYS) regarding the nature of the accommodation. Relief for missed academic work is not guaranteed.
3. If you are absent for reasons other than medical reasons, for more than 3 days, or exceed 1 request per term you MUST visit the Associate Dean's Office (JHE/A214). You may be required to provide supporting documentation.
4. This form must be submitted during the period of absence or the following day, and is only valid for academic work missed during this period of absence.
5. It is the prerogative of the instructor of the course to determine the appropriate relief for missed term work in his/her course.
6. You should expect to have academic commitments Monday through Friday but not on Saturday, Sunday or statutory holidays.

7. If you require an accommodation to meet a religious obligation or to celebrate an important religious holiday, you may submit the Academic Accommodation for Religious, Indigenous and Spiritual Observances (RISO) Form to the Associate Dean's Office. You can find all paperwork needed here:
<http://www.eng.mcmaster.ca/current/documents.html>

NOTICE REGARDING POSSIBLE COURSE MODIFICATION

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

TURNITIN.COM STATEMENT

In this course we will be using a web-based service (Turnitin.com) to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to <http://www.mcmaster.ca/academicintegrity/>.

ON-LINE STATEMENT FOR COURSES REQUIRING ONLINE ACCESS OR WORK

In this course, we will be using Avenue to Learn. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.