

ENG PHYS 3ES3
Introduction to Energy Systems
 Fall 2017
 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. The environmental impact of energy technologies, with an emphasis on climate change, will be examined. Innovations in energy technologies and systems will also be discussed.

PRE-REQUISITES AND ANTI-REQUISITES

Prerequisite(s): Registration in level III or above of an Engineering program or permission of the Instructor.

Antirequisite(s): MECH ENG 4O04 and CHEM ENG 4A03

INSTRUCTOR OFFICE HOURS AND CONTACT INFORMATION

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

Office Hours:

 After each lecture and by appointment

TEACHING ASSISTANT OFFICE HOURS AND CONTACT INFORMATION

Name	Email	Office	Office Hours
Colleen Chau	chauc1@mcmaster.ca	TBD	TBD
Leticia Monteiro Gonçalves	monteil@mcmaster.ca	TBD	TBD
Curtis Goosney	TBD	TBD	TBD
Andrey Goussev	goussev@mcmaster.ca	TBD	TBD
Amanda Victorious	victorap@mcmaster.ca	TBD	TBD

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

Required Texts: None.

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

Recommended Reference book (electronic copy available from library):

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

Calculator: Only the McMaster Standard Calculator will be permitted in tests and examinations. This is available at the Campus Store.

Other Materials: None.

COURSE OVERVIEW

Date/Week	Lecture Topics	Readings
September 6-7, 2017	Introduction	
September 11-14, 2017	Background material	With Assignment #1
September 18-21, 2017	Background material	With Assignment #2
September 25-28, 2017	Human factors	With Assignment #3
October 2-5, 2017	Conventional Energy Sources/Uses	
October 9-14, 2017	Mid-term Recess	
October 16-19, 2017	Renewable Energy Sources	
October 23-26, 2017	Energy Conversion	With Assignment #4
October 30 – November 2, 2017	Energy Storage and Transport	With Assignment #5
November 6-9, 2017	Climate Change	With Assignment #6
November 13-16, 2017	Climate Change	With Assignment #7
November 20-23, 2017	Environmental Impact	With Assignment #8
November 27-30, 2017	Comparison of Energy Technologies	
December 4-6, 2017	Conclusions	

At certain points in the course it may make good sense to modify the schedule outlined above. The instructor reserves the right to modify elements of the course and will notify students accordingly, both in class and on Avenue to Learn. Posted changes take precedence over this course outline.

ASSESSMENT

Date/Week	Topic	Resource for questions (TA# TBD)
Wednesday, September 13, 2017	Student Input due	Rafael Kleiman
Wednesday, September 20, 2017	Assignment 1 due	TA1
Wednesday, September 27, 2017	Assignment 2 due	TA2
Wednesday, October 04, 2017	Assignment 3 due	TA3
Wednesday, October 18, 2017	Energy Innovation Talk due	TA4, TA5
Wednesday, October 25, 2017	Assignment 4 due	TA1
Wednesday, November 01, 2017	Assignment 5 due	TA2
Wednesday, November 08, 2017	Assignment 6 due	TA3
Wednesday, November 15, 2017	Assignment 7 due	TA4
Wednesday, November 22, 2017	Assignment 8 due	TA5
Wednesday, December 06, 2017	Written Report due	All TAs

All submissions must be made via Avenue to Learn.

Component	Weight	Notes
Student Input, due September 13, 2017	5%	No extensions
Assignments (8)	40%	No extensions
Energy Innovation Talk, due October 18, 2017	15%	-1%/day late
Written Report, due December 06, 2017	25%	-5% on December 7, not accepted after that
Final Exam, Dec. 8-21, set by Registrar	15%	Covering lectures, readings and assignments
Total	100%	

Attendance at lectures and participation in classroom discussions is expected.

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 an ability to identify and quantify the full range of short-term, long-term, local and global impacts of their engineering projects on society, including: economic aspects; social, cultural, and human health aspects, and; ecosystem integrity aspects.	9.1
2. 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
3. Can demonstrate an ability to assess the options from a sustainability engineering perspective, which emphasizes environmental stewardship and long-term decision-making.	9.3

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-H301 (Hatch Building)). 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.

REFERENCE TO RESEARCH ETHICS

The two principles underlying integrity in research in a university setting are these: a researcher must be honest in proposing, seeking support for, conducting, and reporting research; a researcher must respect the rights of others in these activities. Any departure from these principles will diminish the integrity of the research enterprise. This policy applies to all those conducting research at or under the aegis of McMaster University. It is incumbent upon all members of the university community to practice and to promote ethical behaviour. To see the Policy on Research Ethics at McMaster University, please go to <http://www.mcmaster.ca/policy/faculty/Conduct/ResearchEthicsPolicy.pdf>.