ENG PHYS 3ES3
Introduction of Energy Systems
Fall 2020
Course Outline

CALENDAR/COURSE DESCRIPTION

Students will systematically study subjects related to a wide range of energy, environmental and economic fields.
Class: Monday & Thursday: 12:30-13:20pm; Tuesday: 13:30-14:20pm.
Classes will be conducted by zoom by sharing the PPT materials etc. These will be recorded and posted in AtoL for 24 hours.
The course will start on September 8, 2020.

PRE-REQUISITES AND ANTI-REQUISITES

Prerequisite(s): NA
Antirequisite(s): NA

INSTRUCTOR OFFICE HOURS AND CONTACT INFORMATION

Shinya Nagasaki
NRB 105
nagasas@mcmaster.ca
ext. 27090

Office Hours:
by appointment

TEACHING ASSISTANT OFFICE HOURS AND CONTACT INFORMATION

TBD
@mcmaster.ca

TBD
@mcmaster.ca

Office Hours:
By appointment

COURSE WEBSITE/ALTERNATE METHODS OF COMMUNICATION

http://avenue.mcmaster.ca/

COURSE INTENDED LEARNING OUTCOMES

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

- demonstrate an ability to define what the energy systems are.

- demonstrate an ability to understand not only physics, chemistry and math on energy but also the relationship between economical and the environmental issues and energy systems.
- demonstrate an ability to understand the uncertainty and the intra- and inter-generation gaps in the risks, and to demonstrate an ability to emphasize the engineers' ethics and responsibilities in the decision-making under the risks.
- To demonstrate an ability to identify the short- and long term interactions between the technologies of energy systems and the environment and economy quantitatively and/or qualitatively.
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MATERIALS AND FEES

Required Texts:
NA
PDF files of course materials an instructor uses in the class will be posted on AtoL.

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

Other Materials:
F.M. Vanek, L.D. Albright, L.T. Angenent: Energy Systems Engineering: Evaluation and Implementation, Third Edition, McGraw Hill.

COURSE FORMAT AND EXPECTATIONS

The course is organized as follows:
- 3 virtual lectures per week
- 8 assignments (plural assignments may be given in one week)
- 10 in-class quizzes
- Final Exam (mandatory)

COURSE OVERVIEW

Schedule may change. New schedule is announced in AtoL.
All classes will be conducted by zoom using screen sharing. More details are posted on AtoL.

Date/Week	Topic	Readings
Week 1	Introduction	
Week 2/3	Energy Technologies	
Week 4/5	Energy Systems	
Week 6/7	Energy and Environment	
Week 8/9	Energy, Environment and Economics	
Week 10/11/12	Energy Debate	

Attendance is not checked except weeks of Energy Debate.
No-attendance during Energy Debate: 1 point penalty for each.

Quiz & Final Exam
This is the 1st experience for students to participate in the full virtual/on-line lectures. So, in this course, students can select: (1) Partcipate in the virtual lectures and answer 10 in-class quizzes, or (2) Don't answer any in-class quizzes and transfer the 20% weight of quiz to the Final Exam.

In addition to zoom virtual lectures, students will be required to make an energy debate group (7-8 students per group). Each group will make two sub-groups (3-4 students per sub-group).
Each group decides one topic on controversial energy issue. One group is pro and the other is con for the issue. For example, topic is "McMaster will replace the nuclear power reactor in 2025". Pro group will develop the argument to support the replacement and Con group will develop to oppose it (including the claim to stop the reactor now). Debate (15min) between sub-groups will be taken by video by yourselves and shared at course. Any topics related to energy are welcome. For example, "Since we can burn and extract the energy from plastic, the plastic trash problem is not a problem".
In the week10-12 (plan schedule. Last 2-3 weeks of course), each group shows its video to all students, TAs and instructor. Format will be announced in the 1st class. All students (except the group member) and TAs will vote which argument is more acceptable.

ASSESSMENT

Component	Weight
Quiz	20% (2% x 10 quizzes)
Assignment	40% (details are posted on AtoL)
Energy Debate	Win 20%; Lose 15%
Final Exam	20% (40% if students select non-answer quiz option)
Total	100%

We might have 1-2 special talks. If we have, students who give the question will obtain extra 1 point/question.

Taking the Final Exam is mandatory. In the Final Exam, if you write answers that are not related to the questions, you certainly fail.

Students are required to write the answer of quizzes and submit it to AtoL during the lecture time slot (10 or 15min). Students are required to submit the assignment answer within one week to AtoL (if assignment is given Monday class, submit by 23:59pm on Monday). The Midterm Recess is not included in this one week, namely students have practically two weeks if the assignment is given in the week of Oct 5, 2020. Late submission is not accepted (no mark).

According to the recommendation of MacPherson Institute about virtual class, students are required not to show your face (i.e. camera OFF) due to internet environment, except Energy Debate weeks. Hence, an instructor does not check the attendance in Week 1 – 9.

The weights of assignment and debate never be transferred to the Final Exam. The weight of quiz for students who select answer-quiz option is also not be transferred to the Final Exam.
Only visa-students who must take this course from his/her home country (outside Canada), quizzes are not required, and the weight is transferred to Final Exam. But, he/she must submit the evidence that he/she is not in Canada by September 9, 2020 to the instructor.

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 the competence in physics, chemistry and mathematics which relates to system, economic, sustainability analysis in energy systems.	1.2 Quiz, Assignment, Exam
2. Can demonstrate the competence in engineering which relates to system, economic, sustainability analysis in energy systems	1.3 Quiz, Assignment, Exam
3. Can demonstrate an ability to assess the options from a sustainability engineering perspective, which emphasizes environmental stewadship and long-term economic development.	9.3 Quiz, Assignment, Exam
4. Can demonstrate an ability to draw the politically reasonable, economically feasible, technologically sound, socially acceptable, environmentally fruitful conclusions which are completely supported by solid evidence.	13.5 Quiz, Assignment, Debate, Exam

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

EQUITY, DIVERSITY, AND INCLUSION

Every registered student belongs in this course. Diversity of backgrounds and experiences is expected and welcome. You can expect your Instructor to be respectful of this diversity in all aspects of the course, and the same is expected of you.

The Department of Engineering Physics is committed to creating an environment in which students of all genders, cultures, ethnicities, races, sexual orientations, abilities, and socioeconomic backgrounds have equal access to education and are welcomed and treated fairly. If you have any concerns regarding inclusion in our Department, in particular if you or one of your peers is experiencing harassment or discrimination, you are encouraged to contact the Chair, Associate Undergraduate Chair, Academic Advisor or to contact the Equity and Inclusion Office.

PHYSICAL AND MENTAL HEALTH

For a list of McMaster University's resources, please refer to the Student Wellness Centre.

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. **It is your responsibility to understand what constitutes academic dishonesty.**

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. For information on the various types of academic dishonesty please refer to the *Academic Integrity Policy*, located at https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/

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.

COURSES WITH AN ON-LINE ELEMENT

McMaster is committed to an inclusive and respectful community. These principles and expectations extend to online activities including electronic chat groups, video calls and other learning platforms.

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, 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 a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the *Code of Student Rights & Responsibilities* (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's *Academic Accommodation of Students with Disabilities* policy.

COURSE POLICY ON MISSED WORK, EXTENSIONS, AND LATE PENALTIES

1. It is the students' responsibility to regularly check the course webpage (AtoL) for updates and announcements.
2. Delay submission of quiz and assignment is not marked.
3. Non-attendance at Energy Debate session: 1 point penalty per each.

SUBMISSION OF REQUEST FOR RELIEF FOR MISSED ACADEMIC WORK

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work".

1. **Relief for missed academic work worth less than 25% of the final grade resulting from medical or personal situations lasting up to three calendar days:**

    - Use the McMaster Student Absence Form (MSAF) on-line self-reporting tool. No further documentation is required.
    - Students may submit requests for relief using the MSAF once per term.
    - An automated email will be sent to the course instructor, who will determine the appropriate relief. Students must immediately follow up with their instructors. Failure to do so may negate the opportunity for relief.
    - The MSAF cannot be used to meet a religious obligation or to celebrate an important religious holiday.
    - The MSAF cannot be used for academic work that has already been completed attempted.
    - An MSAF applies only to work that is due within the period for which the MSAF applies, i.e. the 3-day period that is specified in the MSAF; however, all work due in that period can be covered by one MSAF.
    - The MSAF cannot be used to apply for relief for any final examination or its equivalent. See *Petitions for Special Consideration* above.

2. **For medical or personal situations lasting more than three calendar days, and/or for missed academic work worth 25% or more of the final grade, and/or for any request for relief in a term where the MSAF has been used previously in that term:**

    - Students must report to their Faculty Office to discuss their situation and will be required to provide appropriate **supporting documentation**.
    - If warranted, the Faculty Office will approve the absence, and the instructor will determine appropriate relief.

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

EXTREME CIRCUMSTANCES

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, AtoL and/or McMaster email.