UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Department of Physics & Astronomy
Science B 605
403 220-5385
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COURSE OUTLINE

1. **Course:** PHYS 371, Introduction to Energy - Fall 2022

   Lecture 01 : MWF 11:00 - 11:50 in CHC 105

Instructor	Email	Phone	Office	Hours
Dr. Laura Mazzino	laura.mazzino@ucalgary.ca	403 220-8648	SB 533	Monday 13:30-14:30

   To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

   In Person Delivery Details:

   This course is being offered in person.

   All attendees are required to comply with the University's measures to avoid the spread of Covid-19 in the University community. In the eventuality that there must be a move to online learning directed by the university, **please do not email the instructor:** you will be contacted by your instructor immediately to receive further instructions**.** Information will be sent to you if and as it becomes available.

   Please, make a note to visit daily the University of Calgary's Emergency Management site to read the frequent updates.

   https://www.ucalgary.ca/risk/emergency-management/covid-19-response

   Re-Entry Protocol for Labs and Classrooms:

   To limit the spread of COVID-19 on campus, the University of Calgary has implemented safety measures to ensure the campus is a safe and welcoming space for students, faculty and staff. The most current safety information for campus can be found here.

   Course Site:

   D2L: PHYS 371 L01-(Fall 2022)-Introduction to Energy

   (Starts September 6, 2022)

   Note: Students must use their U of C account for all course correspondence.

   Equity Diversity & Inclusion:

   The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

   The Physics and Astronomy EDI Committee acknowledges there are persistent barriers that prevent such accessibility and hinder our progress towards EDI. Our representatives (faculty, postdocs, graduate and undergraduate students) are committed to addressing any concerns and work towards proactive solutions that enact necessary change within the department. To submit anonymous questions, comments or concerns regarding EDI related issues, please reach out to our Associate Head EDI, Claudia Gomes da Rocha (claudia.gomesdarocha@ucalgary.ca)

2. **Requisites:**

   See section 3.5.C in the Faculty of Science section of the online Calendar.

   Students must attend in-person lectures to complete daily in-class work (group discussions).

3. **Grading:**

The University policy on grading and related matters is described in F.1 and F.2 of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Course Component	Weight	Due Date (duration for exams)	Modality for exams	Location for exams
Course Etiquette (Respect, Grace & Courtesy). Communication Guidelines[1]	5%	Ongoing		
In Class Group Discussions and Summaries (weekly worksheets - 12 in total)[2]	10%	Ongoing		
In class participation (TOPHAT: Polls, discussions) - 80% completion needed for 100% mark.[3]	10%	Ongoing		
Reflective Writing (1 entry weekly per group - 10 entries total)[4]	10%	Ongoing		
Online Assignments – Weekly (9 items, lowest dropped)	10%	Ongoing		
2% BONUS MARKS: Scavenger Hunt [5]	0%	Ongoing		
Midterm 1[6]	15%	Oct 07 2022 at 11:00 am (45 Minutes)	in-person	In class
Midterm 2[7]	15%	Nov 04 2022 at 11:00 am (45 Minutes)	in-person	In class
Registrar Scheduled Final Exam[8]	25%	Will be available when the final exam schedule is released by the Registrar	online	Will be available when the final exam schedule is released by the Registrar

[1] Students are responsible for reading the Course Etiquette & Communication Guidelines, posted on D2L, under COURSE INFORMATION. By attending the course, students agree with and are responsible for following both the Course Etiquette & Communication Guidelines.

[2] ***The 2 lowest will be dropped*** Worksheets will be marked for completion (partially completed worksheets will receive the appropriate grading). Feedback will be submitted on the content of the worksheets, but students will not be penalized for errors on it. Groups submitting less than 80% of the worksheets will receive a grade accordingly to the amount of work submitted. *NO exceptions*

[3] Around 5 questions per week. 80% completion is needed for 100% of the grade. Questions must be answered during class but they are open for 24 hours to address possible technical issues. Students are RESPONSIBLE to double-check their answers have been recorded by the software before the question expires. STUDENT MUST SIGN IN WITH THE UCALGARY EMAIL ACCOUNT TO RECEIVE CREDIT.

[4] ***The 2 lowest will be dropped*** Reflective writing will be marked following the rubric provided in D2L, under the "Course Information" module, in the "Reflective Writing" submodule. Samples and checklists, as well as further information, can also be found under that module.

[5] Available starting September 7, 2022, this fun group activity will help you to discover places around campus that relate to concepts covered in this course. Submission through Dropbox, one per group required. Due September 30,

[6] Administered on D2L. Students should BRING THEIR OWN (well charged) ELECTRONIC DEVICE AND CALCULATOR to complete the midterm in class. Hard copies of the midterm will be available for those students without an electronic device; students requiring this accommodation must sign up at the beginning of the semester by submitting the corresponding form in the designated Dropbox folder.

[7] Same as midterm 1 (item above)

[8] The final exam will have similar features that the midterm exams. Details about the final exam will be given to students during lectures on the last week of classes.

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	95 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	50 %	45 %

The percentage grade for the course must be equal to or larger than the stated value to obtain a certain letter grade, without rounding.

Course Etiquette: Students will conduct respectful behavior toward their other classmates, the Teaching Assistants, and to the instructor, during classes and during office hours, which will result in 5% of the final grade awarded to them.

Communication guidelines: Students are required to read and agree to the Communication Guidelines for this course, as posted on D2L. Students MUST use their UCalgary email account for any communications. Emailing should be limited to business hours and will be responded to during the same hours: Monday-Friday 9 am - 5 pm. Students must include in the subject line: 1) the course code (examples: PHYS371 F2022), 2) their first and last name and 3) their UCID number. Correspondence from private accounts, other than the UofC official accounts, or without the required information in the subject line will NOT be answered. When communicating with the instructor on important matters, please allow 3-4 work days for a response to messages and e-mail inquiries. Technical solutions to homework questions will not be provided by email. Students are expected to ask these types of questions in person. **PLEASE DO NOT EMAIL THE INSTRUCTOR for day-to-day issues (ask during the lectures or visit the office hours). Emailing the instructor is reserved for very important issues (such as extended absence related to health or other, that will result in missing work beyond what is already accommodated in the compassionate grading scheme).** Office hours are a great opportunity to get one-on-one help with the course in general and particular questions regarding a topic, a concept, an assignment, course management, etc. TAs will also have office hours to help you with anything you need.

The Piazza forum is set up for this course (see login information below) to facilitate peer-interaction and to receive peer-feedback. The course's PIAZZA forum will be monitored by the instructor at least once a week.

Piazza: piazza.com/ucalgary.ca/fall2022/phys371f2022 (access code on D2L under "Student Resources")

In-class group discussions: will include 10 minutes of group discussions with the exploration of online simulations, doing calculations, discussing topics from the reading assignments, and completing the questions posted in the group worksheets. For more information and detailed instruction regarding in-class group discussions, please visit D2L: "Resources for Students - Group Discussions". Group discussions are released on Monday morning (shortly before class) and they are due the following Monday at 4:59 pm. The first group discussion submission is due September 12. **NO LATE SUBMISSIONS ARE ACCEPTED.**

TopHat: In-class participation will include short discussions with students sitting next to each other and answering in-class questions. For more information and detailed instruction regarding how to sign up to the TopHat course site, please visit D2L: "Resources for Students - TopHat". Questions are released during the class and they are open until the following day at 4:59 pm. **NO LATE SUBMISSIONS ARE ACCEPTED.**

TopHat: "*FALL 2022 PHYS 371 INTRODUCTION TO ENERGY*". Join Code: 328719 (passcode on D2L under "Student Resources"). STUDENT MUST SIGN IN WITH THE UCALGARY EMAIL ACCOUNT TO RECEIVE CREDIT.

Reflective writing: Students will work in groups to create an entry each week and submit it on D2L. Length and rubric/grading details will be explained in the second class and are described in detail in the D2L "Resources for Students-Reflective writing" section. Reflective writing submissions for a particular week are due the following Monday at 4:59 pm with the group discussions. The group discussions and the reflective writing will each have their separate dropbox folder. The first reflective writing submission is due on September 19, 2022, at 4:59 pm. **NO LATE SUBMISSIONS ARE ACCEPTED.**

Assignments: The assignments will be completed through D2L. Assignments will be released on Friday morning (shortly before class) through the Assignments (under Quizzes) in the D2L environment and they are due the following Friday at 4:59 pm. For more information, consult D2L, under the section "Resources for Students - Assignments". **NO LATE SUBMISSIONS ARE ACCEPTED.**

Students will complete an initial "Assignment 0" before the second class. This assignment is an initial assignment regarding important information presented in this course outline and is set up for unlimited attempts. Assignment 0 will become available on September 1, 2022, in the D2L assignment section, under "quizzes" and will have a "0%" grade associated with it. However, the completion of Assignment 0 with 100% is a requirement to 'unlock' the rest of the material for the course on D2L. If a student forgets to answer this assignment or did not score 100% yet, their D2L shell will show empty. After achieving 100% in this initial assignment, all available content for the course (and subsequent content uploaded throughout the course) will appear automatically.

Midterms: See "Exam Policy" section. Further details about midterms will be given in the lecture, 1 week prior to each midterm exam.

Final Exam: See "Exam Policy" section. Further details about the final exam will be given in the lecture, 1 week prior to the last day of class.

Bonus points: A 'scavenger hunt' around campus related to ENERGY! Join your group for this fun activity and all members of your group will receive a 2% bonus in their final grade. The scavenger hunt will open the second

week of class and will close on September 30. Details will be given during the second lecture and detailed information will be posted on D2L.

This course will have a Registrar Scheduled Final exam that will be delivered on-line. The Final Examination Schedule will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

Per section G.5 of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform. Due to the scheduling of the final exams, the additional time will be added to **the end** of the registrar scheduled **synchronous** exam to support students. This way, your exam schedule accurately reflects the **start time** of the exam for any **synchronous** exams. E.g. If a **synchronous** exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the **end** time of the **synchronous** exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm.

The University of Calgary offers a flexible grade option, Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade

4. **Missed Components Of Term Work:**

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

**********PLEASE NOTE: NO LATE SUBMISSIONS WILL BE ACCEPTED IN THIS COURSE **********

Compassionate relief for life eventualities has already been accounted for (see grading scheme, dropped of lowest scores for some components, 80% completion requirement for some components). Use this at your own discretion and use it wisely.

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5. **Scheduled Out-of-Class Activities:**

There are no scheduled out of class activities for this course.

6. **Course Materials:**

Recommended Textbook(s):

Nick Jell, *Renewable Energy: A Very Short Introduction*: Oxford University Press.
Nick Jenkin, *Energy Systems: A Very Short Introduction*: Oxford University Press.

Students are required to bring a phone, computer, tablet, or a similar electronic device to complete in-class worksheets and TopHat questions.

Although recommended textbooks are a good complement to the class material, providing excellent summaries of the content of the course, **the textbooks are supplementary and not mandatory**: the day-to-day work will be done using the website: https://energyeducation.ca/encyclopedia/Main_Page

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC ELearning online website.

7. **Examination Policy:**

   Exams will be conducted in the D2L environment.

   Students MUST complete both midterms and exams INDIVIDUALLY, without any kind of help from someone else.

   The use of camera devices, MP3 Players and headphones, or wireless access devices such as cell phones, Blackberries, chat rooms, online discussion, etc., during examinations, will not be allowed.

   7.a) Midterm Exams:

   Both midterm exams are closed-book exams.

   Midterm exams will be conducted on the D2L environment. Students MUST BRING THEIR OWN (well charged) ELECTRONIC DEVICE and a CALCULATOR (of any kind including graphing or programmable calculators) to complete these assessments in class.

   Students are allowed to use in the exams a personalized letter size page (8.5 x 11 in; 22 cm x 28 cm) front and back with formulas and personal notes.

   The use of the internet, apart from connecting and launching D2L, or the use of notes in electronic format will not be allowed during the midterm exams.

   Hard copies of the quizzes will be available for those students without an electronic device to complete the assessments; students requiring this accommodation must sign up at the beginning of the semester by submitting the corresponding form in the designated Dropbox folder.

   Resources to study for the midterm exams (blue slides) will be provided during class.

   7.b) Final Exam:

   The final exam is an ONLINE exam.

   Resources to study for the final exam (purple slides) will be provided during class.

   Students should also read the Calendar, Section G, on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

   There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

   For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section E.2 of the University Calendar.

10. **Human Studies Statement:**

    Students will not participate as subjects or researchers in human studies.

    See also Section E.5 of the University Calendar.

11. **Reappraisal Of Grades:**

    A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See Section I.3 of the University Calendar.

    a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections I.1 and I.2 of the University Calendar

    b. **Final Exam:** The student shall submit the request to Enrolment Services. See Section I.3 of the University Calendar.

12. **Other Important Information For Students:**

a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, Mental Health Services Website) and the Campus Mental Health Strategy website (Mental Health).

b. **SU Wellness Services:** For more information, see their website or call 403-210-9355.

c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at 403-220-2208. The complete University of Calgary policy on sexual violence can be viewed here.

d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional Code of Conduct and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

Student Handbook on Academic Integrity
Student Academic Misconduct Policy and Procedure
Faculty of Science Academic Misconduct Process
Research Integrity Policy

Additional information is available on the Student Success Centre Academic Integrity page

e. **Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the Request for Academic Accommodation Form and sending it to Dr. David Feder by email phas.ahugrd@ucalgary.ca preferably 10 business days before the due date of an assessment or scheduled absence.

f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see Legal Services website.

g. **Student Union Information:** SU contact, Email SU Science Rep: sciencerep1@su.ucalgary.ca, Student Ombudsman

h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction (USRI) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a

course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or non-academic misconduct, in addition to any other remedies available at law.

Course Syllabus

Week 1: Introduction to the course. Concept of energy.

Week 2: Modeling energy and matter. Brief Chronology of Human use of Energy.

Week 3: Examples of Energy usage pre–Industrial Revolution. Energy and Work. Power.

Week 4: Electricity. Electromagnetism. Generation of electricity. Storage, and Distribution of electricity.

Week 5: Examples of Energy usage post–Industrial Revolution. Thermodynamics. *Midterm 1*

Week 6: Heat Engines. Thermal energy.

Week 7: Heating our homes.

Week 8: Heating our homes.

Week 9: Nuclear Power, Solar. *Midterm 2*

Week 10: TERM BREAK. NO CLASSES.

Week 11: Wind, Hydro.

Week 12: Wave, Tidal. Geothermal.

Week 13: Primary energy, end-use, energy for society: Social consequences.

Week 14: Fossil fuels. Energy and Climate. Environmental consequences and climate change.

Course Outcomes:

- What energy is and how it is used
- The advantages and disadvantages of various sources of primary energy
- What electricity is and how it is produced & distributed
- How our energy use ties to our changing climate.
- Analyze how our quality of life depends on energy consumption
- Analyze, evaluate and discuss the consequences of energy choices

Electronically Approved - Sep 01 2022 11:23

Department Approval

Electronically Approved - Sep 01 2022 22:43

Associate Dean's Approval