

UNIVERSITY OF CALGARY  
FACULTY OF SCIENCE  
DEPARTMENT OF PHYSICS AND ASTRONOMY  
COURSE OUTLINE

1. **Course:** Physics 371, Introduction to Energy Fall 2017

**Instructor:** Dr. Jason Donev | SA 101A | 403.210.6343 | [jmdonev@ucalgary.ca](mailto:jmdonev@ucalgary.ca) | Office Hours: Mon 14:00-15:30, Tues 13:30 – 14:30, Friday 11:00-12:00

**Lecture Sections:** L01 | MWF 09:00 - 09:50 | TITL Forum

**Course Website:** [d2l.ucalgary.ca](http://d2l.ucalgary.ca)

**Departmental Office:** SB 605, 403-220-5385, [phasugrd@ucalgary.ca](mailto:phasugrd@ucalgary.ca)

2. **Prerequisites:** Some previous exposure to physics, e.g., Science 10, is strongly recommended. Not intended for Physics majors and will not count in the field of Physics. **Students who do not meet these requirements will be removed from the course.** Note: The Faculty of Science policy on pre- and co-requisite checking is outlined in the 2016-2017 Calendar. A student may not register in a course unless a grade at least "C-" has been obtained in each pre-requisite course; it is the responsibility of students to ensure that their registrations are in order. See <http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html> for details.
3. **Grading:** The University policy on grading and related matters is described sections [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

In class work (worksheets and clickers): 5%

Homework: 25%

Midterm Examinations (2): 40%

Final Examination: 30% (To be scheduled by the Registrar)

Percentage to letter grade conversion scale:

> = 95 %	A +	> = 84 %	B +	> = 75 %	C +	> = 65 %	D +
> = 90 %	A	> = 81 %	B	> = 71 %	C	> = 60 %	D
> = 87 %	A -	> = 78 %	B -	> = 68 %	C -	< 60 %	F

- There will be two in-class midterm exams. There will be a final exam scheduled by the registrar.
  - Each piece of work submitted by the student will be given a percentage score. The student's average percentage score for the various components 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 course percentage and letter grade is given above.
4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.6](#) of the University Calendar
5. **Scheduled out-of-class activities:** none
6. **Course Materials:** The required text for this course is the website "energyeducation.ca", available for free online. Top Hat Monocle will be used for grades.
7. **Examination Policy:** Students should read the Calendar, [Section G](#), on Examinations.

8. **Course fees:** none
9. **Writing across the curriculum:** In this course, the quality of the student's writing in laboratory reports will be a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.
10. **Human studies statement:** Students in this course are not expected to participate as subjects or researchers. See also [Section E.5](#) of the University Calendar.

11. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- (a) **Academic Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties.
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at [http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities\\_0.pdf](http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf). Students needing an Accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Physics and Astronomy, Dr. David Feder, by email ([dfeder@ucalgary.ca](mailto:dfeder@ucalgary.ca)) or by phone (403.220.3638).
- (d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). As one consequence, 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 also <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **Student Union Information:** [VP Academic](#) Phone: 220-3911 Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).  
SU Faculty Rep: Phone: 220-3913 Email: [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca) and [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca)  
Student Ombuds Office: 403 220-6420 Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca); <http://ucalgary.ca/provost/students/ombuds>
- (g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (h) **U.S.R.I.:** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses ([www.ucalgary.ca/usri](http://www.ucalgary.ca/usri)). Your responses make a difference - please participate in USRI Surveys.

12. **OTHER COURSE RELATED INFORMATION:**

(a) **Course Description**

Energy is key for our quality of life, but misconceptions about energy abound. This course is an exciting overview of energy issues relevant in the modern world. This course will discuss why we use fossil fuels, what the consequences are and what options are available, and the issues associated with those options. These will include nuclear, solar and wind power.

## (b) Course Learning Outcomes

At the end of this course students should be able to discuss:

- What is energy? How is it used?
- What is electricity?
- How is electricity produced?
- How is electricity distributed?
- What are the sources of energy that our society uses, and how are they used?

At the end of the course, students should be able to:

- Analyze how our quality of life depends on energy consumption.
- Appraise the fundamental limitations and drawbacks of relying on sources of energy.
- Effectively analyze, evaluate and discuss energy choices.

## (c) Course Learning Incomes

At the beginning of the course, students should be able to:

- Convert numerical quantities from one set of units to another with given unit conversions (eg. 100 cm = 1 m, how many meters is 324 cm?)
- Solve linear algebraic equations (eg. If  $3y+6=12$ , what is the value of  $y$ ?)
- Use a calculator to find the sin, cos and tan of an angle (eg. Find  $\cos 40^\circ$  with a calculator).
- Read line, bar and pie charts
- Discuss controversial topics such as climate change, fracking and poverty in a mature and respectful manner.

## (d) Course Information

### Attendance and Classroom Behavior

To do well in this course: read the assigned passages before coming to class; show up, and participate in class discussions, including submitting clicker questions; and do the weekly homework assignments. This is a large lecture course which will break into small group discussions; courteous behavior is expected. If you fall behind or have trouble, I expect you to come to me and then we can figure out what can be done about it. The earlier in the course you approach me the more help I can be. Bring a calculator, a way to answer clicker questions, paper and a writing implement to class.

The required material will be presented in class and in readings, and you will be responsible for all information presented in class (even if not in the readings) and in the readings (even if not presented in class). Additionally, you will occasionally have to go outside of the classroom materials to find more information.

**Student Response Systems** – I will be using the Top Hat clicker system to ask questions about what you've read and the material that we cover in the lecture. Half of your points will be determined by if you answer and half will be based on if you get the answer correct.

**Worksheets** – I will hand out worksheets to be completed in small groups in class. Some of these worksheets will require you to work with students in your group outside of class.

**Homework** – I've done my best to create problems that I believe you'll be able to solve, in a relatively timely fashion. If I am wrong, and experience has shown that I will be from time to time, it's easier for me to issue retractions a couple of days before it's due rather than the day of. Homework will be done on a weekly basis and due on Wednesdays at midnight, unless stated otherwise.

**Exams** – There will be two mid-term exams during the semester and one comprehensive, final exam scheduled by the registrar. Material will come from class lectures, readings, homework, and worksheets. These exams will ask you to discuss energy issues and choices that the course has talked about.

### Topic outline

The following is a general guideline of what topics we'll be covering:

The week starting on:	The topics covered (pages from energyeducation.ca will be organized into chapters and posted on D2L)
Sept 11 <sup>th</sup>	Course overview and Our Changing Planet (Chapter 1)
Sept 18 <sup>th</sup>	High-Energy Society (Chapter 2)
Sept 25 <sup>th</sup>	Energy: A Closer Look (Chapter 3)
Oct 2 <sup>nd</sup>	Midterm 1 (Oct 6 <sup>th</sup> ), Turning heat into work (Chapter 4)
Oct 9 <sup>th</sup>	(Oct 9 <sup>th</sup> is Thanksgiving) Fossil Fuel Energy (Chapter 5)
Oct 16 <sup>th</sup>	Fossil Fuel Energy (Chapter 5)
Oct 23 <sup>th</sup>	Env. Impacts of Fossil Fuels (Chapter 6)
Oct 30 <sup>th</sup>	Nuclear Energy (Chapter 7)
Nov 6 <sup>th</sup>	Midterm 2 (Nov 8 <sup>th</sup> ), reading break starts on Nov 10 <sup>th</sup> .
Nov 13 <sup>th</sup>	Energy from natural nuclear processes: geothermal and solar power (Chapter 8)
Nov 20 <sup>th</sup>	Indirect from the Sun: Water, Wind, Biomass (Chapter 9)
Nov 27 <sup>th</sup>	Keeping Warm: The Science of Climate (Chapter 10)
Dec 4 <sup>th</sup>	Finishing up to Last day of class

Department Approval \_\_\_\_\_ Date \_\_\_\_\_