### Geography 459: Energy & Sustainability - Course Outline F12

Instructor – Paul Parker, Department of Geography and Environmental Management

Classroom – weekly classes F 8:30-11:20, EV2 2002

Office Hours: TA, Iffat Mannan, Elena Kraljevska, Thur, 10:00-11:30 EV1 room 344

Office Hours: Instructor, Friday 11:30-12:30, Tuesday 11:00-12:00 EV1 room 106

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### Course Description

The major global energy systems: coal, oil, gas, nuclear, wind, solar and other renewables are examined. The distribution of energy resources and changing consumption patterns are reviewed. International comparisons will be made and the environmental impacts of different energy systems studied. Global climate change, its connection to energy consumption and more sustainable future options are explored.

### Lecture and Assignment Schedule

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| --- | --- | --- | --- |
| **Week** | **Lecture Topic** | **Assignment** | |
| **1** | Course Overview / Primary Energy |  | |
| **2** | Coal / Global Greenhouse Gas Emissions |  | |
| **3** | Residential Energy Efficiency | 1. Emission / Climate Scenario - due in | |
| **4** | Oil and Gas |  | |
| **5** | Electricity: growing demand, green? |  | |
| **6** | Conservation Options for Residential Energy Systems | 2. Group project presentations - household energy | |
| **7** | Nuclear |  | |
| **8** | Costs and Community GHG Inventories |  | |
| **9** | Hydro, Solar | |  |
| **10** | Community Energy Planning | 3. Community project presentations | |
| **11** | Wind, Energy coops, Tidal |  | |
| **12** | Costs, impacts, smart grid |  | |

Course information and assignment descriptions are posted on LEARN.

## *Readings*

#### Required Text: B. Everett, G. Boyle, S. Peake, J. Ramage 2012 Energy Systems and Sustainability. Oxford: Oxford University Press.

No single text covers all the material. Students are encouraged to read widely, starting with the readings and web sites listed on the LEARN course site:

See the course LEARN site for additional reference resources.

## *Evaluation*

Final grades for the course will be based on:

CO2 emission / climate scenario [Assignment 1](https://uwangel.uwaterloo.ca/AngelUploadsuwangel/Content/UW-MCL-C-090831-101832/_assoc/7FA3CFBB29B0CBA19BA465217C33016F/PaulsFilescoursesGeog459/G459Web03/G459As1.htm) (10%); due Friday week 3, 8:30am

Residential energy conservation [group assignment](https://uwangel.uwaterloo.ca/AngelUploadsuwangel/Content/UW-MCL-C-090831-101832/_assoc/7FA3CFBB29B0CBA19BA465217C33016F/PaulsFilescoursesGeog459/G459Web03/G459As2.htm) (25%); due Friday week 6, 8:30am

Community Energy Planning [energy assignment](https://uwangel.uwaterloo.ca/AngelUploadsuwangel/Content/UW-MCL-C-090831-101832/_assoc/7FA3CFBB29B0CBA19BA465217C33016F/PaulsFilescoursesGeog459/G459Web03/G459As3.htm) (25%); due Friday week 10, 8:30am

Final exam (40%)

Note: Penalties of 10% per day apply for assignments submitted late.

# *University Requirements*

**Academic Integrity:** To create and promote a culture of academic integrity, the behaviour of all members of the University of Waterloo is based on honesty, trust, fairness, respect and responsibility Check [www.uwaterloo.ca/academicintegrity/](http://www.uwaterloo.ca/academicintegrity/) for more information. Students who are unsure what constitutes an academic offence are requested to visit the on-line tutorial at: <http://www.lib.uwaterloo.ca/ait/>

**Consequences of Academic Offences:** Within ENV, those committing academic offences (e.g. cheating, plagiarism) will be placed on disciplinary probation and will be subject to penalties which may include a grade of 0 on affected course elements, 0 on the course, suspension, and expulsion.

ENV students are strongly encouraged to review the material provided by the university’s Academic Integrity office (see: <http://uwaterloo.ca/academicintegrity/Students/index.html>).

**Grievance:**  A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4, [www.adm.uwaterloo.ca/infosec/Policies/policy70.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm).

**Discipline:** A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Graduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline, [www.adm.uwaterloo.ca/infosec/Policies/policy71.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm). For typical penalties, check Guidelines for Assessment of Penalties, [www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm](http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm)

**Appeals:** A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read Policy 72 - Student Appeals, <http://www.adm.uwaterloo.ca/infosec/Policies/policy72.html>

**Note for students with disabilities:** The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term. Once registered with OPD, please meet with the course instructor, in confidence, to discuss your needs.

**Religious Observances:** Please inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

**Turnitin.com:** Plagiarism detection software (Turnitin) will be used to screen assignments in this course. This is being done to verify that use of all material and sources in assignments is documented. In the first week of the term, details will be provided about the arrangements for the use of Turnitin in this course. Students who do not wish to submit their assignments via Turnitin must indicate this to the instructor by the third week of class. These students will submit their material electronically via email directly to the instructor for evaluation and grading.

**Alternative 3rd assignment: Community Experiential Learning (25%)**

Instead of preparing a community energy plan, work for the REEP House and report on your activities.

*What is the REEP House?*

# REEP House for Sustainable Living

“Kitchener's REEP House for Sustainable Living is your hands-on showroom offering "one-stop-shopping" for green living ideas, from the newest sunlight balanced LED lighting for your kitchen to money-making solar panels on your roof!

[**Tour this Century brick home**](http://www.reepwaterlooregion.ca/prog_house_tours.php) and learn how we found heritage style wood-framed arch-top stained glass windows that are R-7, gorgeous 100 year old recycled flooring, and super insulation.

Use our modeling software to determine the cost, payback and energy savings of green options for your home, and to hook up with suppliers, contractors, grants and financing! “http://www.reepwaterlooregion.ca/prog\_house.php

*How much time am I expected to contribute?* 40 hours (e.g. 4 hrs x 10 weeks) by Dec 7th

