Are you confused by all the talk about fracking, tar sands, the Keystone Pipeline, the proposed Blue Castle nuclear power plant in Green River, or climate change? Do you wonder why we haven’t done more to develop our abundant renewable resources? Can we achieve sustainability?

Come and explore Geography 3963 – Energy Choices in the 21st Century – and learn the truth about Energy – the single factor that may have the greatest impact on your lives and those of your children!
Course Numbers and Title:
Geography 3963/5963 Sec 002
Energy Choices for the 21st Century

Credit Hours:
Three (3) credit hours. Fulfills Physical/Life Science Exploration requirement.

Meeting Times and Locations:

Faculty Office Number, Location and Hours:
Instructor: Dr. Jack Hamilton holds degrees in geology, geochemistry, and environmental management. He was the first Director of the Energy Commercialization Center at the University of Utah and is Adjunct Associate Professor in Metallurgical Engineering. Dr. Hamilton worked for the first 15 years of his career as a petroleum geologist for Texaco and The Dow Chemical Company. Subsequently, he managed regional offices for several national environmental consulting firms before coming to the University in 1998. He has taught an Energy Resources class in the Department of Metallurgical Engineering for the past eight years and been a frequent guest lecturer on the topic of energy.
Office Hours: Dr. Hamilton’s office is located in Room 270K of Orson Spenser Hall (OSH). Meetings with students will be by appointment, after class on-campus, or as otherwise arranged. Phone number is 801-403-7952 and email is jack.hamilton@utah.edu.

Co-instructor: Dr. Ola Opara, opara.ola@gmail.com.

Course Description:
This class is designed to give students an introduction to the critical energy issues facing our planet, with a focus on controversial topics and issues in Utah. These will include: hydraulic fracking (fracking), offshore oil and gas development, oil shale and tar sand development, nuclear energy (with particular regard to the proposed Blue Castle nuclear plant in Green River and storage of radioactive waste in Utah), wind, solar and geothermal energy (again, with emphasis on Utah), other renewable technologies, the Smartgrid, difficulties in commercializing new energy technologies, air pollution, transportation choices, energy policy development, and global issues including population dynamics, climate change, carbon management, water resources, the Law of Unintended Consequences, and tipping points. A number of outstanding guest lecturers will provide expertise in their respective fields.

A basic knowledge of algebra is a prerequisite; calculus is not required.

The class will be taught in ten learning modules, as shown:

1. Energy Basics
2. Heat, Engines and Electricity
3. Conventional Fossil Fuels: Oil, Gas and Coal
4. Unconventional Fossil Fuels: Unconventional Natural Gas, Fracking, Oil Shale, Oil (Tar) Sands
5. Transportation and Air Pollution
6. Nuclear Energy & Nuclear Issues in Utah
7. Renewables I: Wind, Geothermal and Biomass
8. Renewables II: Solar and Hydro
9. Sustainability and Economics
10. Global Climate Change & Carbon Management

There will be an online homework/quiz at the conclusion of each learning module which the students will complete. Feedback will be given so the students will use the quizzes as a learning mechanism.

**Texts:**

**Evaluation Methods and Criteria:**
All quiz and test questions will be covered in the lecture materials and reviewed prior to exams. Lecture PowerPoints will be posted on University of Utah Canvas system. A typical quiz will have two to three problems to solve, two to three short essay questions, and several multiple choice, fill-in-the-blank, or true/false question groups. Each of the two quizzes will cover only the material covered in that section of the class; approximately half of the Final Exam will cover material covered in the last section of the class. The other half of the questions will cover the entire semester. An approximately 10-page term paper is required, but acceptable alternatives are:

- Research paper; approximately 10 pages, double spaced
- A class presentation using PowerPoint
- A SCIF proposal (Sustainable Campus Initiative Fund)
- A research or service project for a non-profit or government agency
- A critical book review

Independent thinking is a prime criterion in grading papers/projects.

Final grades will be scaled on a curve.

**Grading:**
- Quizzes/Homework: 15%
- Midterm Exam: 30%
- Term paper/project: 25%
- Final Exam: 30%
Course Objectives:
At the end of the course, the student will have skills and knowledge that they can use in their everyday lives. They will be able to read and interpret energy news in the context of a global community where energy demand may soon exceed supply. They will also be able to realistically evaluate alternative energy resources and plan conservation measures and lifestyle changes that can help create a sustainable future. They will gain some immediately applicable skills like knowing how to calculate the R-value of insulation, choose an energy-efficient home, select an automobile or reduce air pollution.

Teaching and Learning Methods:
The primary teaching method is lecture and class discussion, and the University Canvas system. All quiz and exam questions will be covered in the lecture materials. Copies of all lecture PowerPoint presentations, other related materials, and quiz/homework will be available on-line on University of Utah Canvas. The Canvas system will be utilized as much as possible to foster student collaboration and to provide feedback to individual students and the group. A term paper, class presentation, project report or book report is also required. The course includes a visit to the University of Utah nuclear reactor and an introduction to campus sustainability initiatives.

Key to Success in this Class:
Your best strategy for success is to attend every class! All test questions will have been covered in class and you may not be able to pick up all the information from Canvas or a friend’s class notes. Both professors are available to provide individual assistance to students.

ADA Statement:
The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.

Faculty and Student Responsibilities:
All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. Faculty must strive in the classroom to maintain a climate conducive to thinking and learning and students have a right to support and assistance from the University in maintaining a climate conducive to thinking and learning.

Content Accommodations:
“Content accommodations” will not be made. This course might expose you to things you find discomforting or dissonant with your beliefs. Accommodations in course content, requirements, or expectations will not be made. Students who find the content of this course objectionable or in violation of their beliefs should drop the class. The U policy: www.admin.utah.edu/facdev/index.html