Course information:
Copy and paste current course information from Class Search/Course Catalog.

Academic Unit: GeogSci&UrbPlan
Department: GeogSci&UrbPlan

Subject: GCU Number: 171 Title: The Thread of Energy Units: 3

Is this a cross-listed course? (Choose one)
SOS 171 The Thread of Energy

Is this a shared course? (choose one) If so, list all academic units offering this course

Requested designation: (Choose One)
Note: a separate proposal is required for each designation requested

Eligibility:
Permanent numbered courses must have completed the university's review and approval process.
For the rules governing approval of omnibus courses, contact the General Studies Program Office at (480) 965-0739.

Area(s) proposed course will serve:
A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study.

Checklists for general studies designations:
Complete and attach the appropriate checklist
- Literacy and Critical Inquiry core courses (L)
- Mathematics core courses (MA)
- Computer/statistics/quantitative applications core courses (CS)
- Humanities, Fine Arts and Design core courses (HU)
- Social and Behavioral Sciences core courses (SB)
- Natural Sciences core courses (NS/SG)
- Global Awareness courses (G)
- Historical Awareness courses (H)
- Cultural Diversity in the United States courses (C)

A complete proposal should include:
☐ Signed General Studies Program Course Proposal Cover Form
☐ Criteria Checklist for the area
☐ Course Syllabus
☐ Table of Contents from the textbook, and/or lists of course materials

Contact information:
Name: Martin J. Pasqualetti Phone: 5-4548
Mail code: 5302 E-mail: Pasqualetti@asu.edu

Department Chair/Director approval: (Required)
Chair/Director name (Typed): Luc Anselin Date: 3/9/2013
Chair/Director (Signature):

Rev. 1/94, 4/95, 7/98, 4/00, 1/02, 10/08, 11/11/12/11, 7/12
Description of How SOS/GCU [1] Meets the SB Designation

The Thread of Energy emphasizes the idea that energy sustainability is a social issues with a technical component, rather than the other way around. This course introduces students to the relationship of human societies across the globe to the larger energy system. The course is cross listed as GCU [11] and SOS [11], GCU being the social science prefix for geography courses. The School of Sustainability, as a part of the Global Institute of Sustainability, stresses certain key concepts in all of our courses that are relevant to the SB designation. One of those concepts is systems thinking—particularly an understanding that human and natural systems are interlinked, and that an understanding of decisions, behaviors, and institutions is critical to understanding any environmental issue such as energy. A second key concept in all SOS courses is that of collaboration and participation. We emphasize the importance of considering all stakeholder groups in the analysis of environmental issues.

The course description and schedule include key concepts topics such as:

- The role of energy in everyday life
- The geography of energy
- The economics of energy
- Energy and environmental costs
- Energy poverty and inequalities across nations and cultures
- How energy affects international relations
- Behavioral change
- Public perceptions and acceptability

The author of one of the texts we selected for this course, "The Energy Reader" is Laura Nader, an anthropologist at UC Berkeley. The entire book places a strong emphasis on the cultural and social dimensions of energy use. Representative chapters include:

- Dimensions of the "People Problem" in Energy Research and "the" Factual Basis of Dispersed Energy Futures
- The House that Uranium Built: Perspectives on the Effects of Exposure on Individuals and Community
- Energy as it Relates to the Quality and Style of Life
- Replacing Myths with Maxims: Rethinking the Relationship Between Energy and American Society
- The Politics of Energy: Toward a Bottom-Up Approach

The developer and teacher of the class, Dr. Martin Pasqualetti, is a geographer who specializes in energy and society. The readings he has chosen and the assignments he has designed emphasize how energy shapes and is shaped by social and cultural institutions and individual decision-making.
Rationale and Objectives

The importance of the social and behavioral sciences is evident in both the increasing number of scientific inquiries into human behavior and the amount of attention paid to those inquiries. In both private and public sectors people rely on social scientific findings to assess the social consequences of large-scale economic, technological, scientific, and cultural changes.

Social scientists' observations about human behavior and their unique perspectives on human events make an important contribution to civic dialogue. Today, those insights are particularly crucial due to the growing economic and political interdependence among nations.

Courses proposed for General Studies designation in the Social and Behavioral Sciences area must demonstrate emphases on: (1) social scientific theories and principles, (2) the methods used to acquire knowledge about cultural or social events and processes, and (3) the impact of social scientific understanding on the world.
### ASU--[SB] CRITERIA

A SOCIAL AND BEHAVIORAL SCIENCE [SB] course should meet all of the following criteria. If not, a rationale for exclusion should be provided.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. Course is designed to advance basic understanding and knowledge about human interaction.</td>
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<td>2. Course content emphasizes the study of social behavior such as that found in:</td>
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<td></td>
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<td>- ANTHROPOLOGY</td>
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<td>- ECONOMICS</td>
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<td>- CULTURAL GEOGRAPHY</td>
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<td>- HISTORY</td>
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<td></td>
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<td>3. Course emphasizes:</td>
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<td></td>
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<td>a. the distinct knowledge base of the social and behavioral sciences (e.g., sociological anthropological).</td>
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<td></td>
<td></td>
<td>b. the distinct methods of inquiry of the social and behavioral sciences (e.g., ethnography, historical analysis).</td>
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<td></td>
<td>4. Course illustrates use of social and behavioral science perspectives and data.</td>
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**THE FOLLOWING TYPES OF COURSES ARE EXCLUDED FROM THE [SB] AREA EVEN THOUGH THEY MIGHT GIVE SOME CONSIDERATION TO SOCIAL AND BEHAVIORAL SCIENCE CONCERNS:**

- Courses with primarily fine arts, humanities, literary, or philosophical content.
- Courses with primarily natural or physical science content.
- Courses with predominantly applied orientation for professional skills or training purposes.
- Courses emphasizing primarily oral, quantitative, or written skills.
Social And Behavioral Sciences [SB]
Page 3

<table>
<thead>
<tr>
<th>Course Prefix</th>
<th>Number</th>
<th>Title</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOS/GCU</td>
<td>171</td>
<td>The Thread of Energy</td>
<td>SB</td>
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</tbody>
</table>

Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

<table>
<thead>
<tr>
<th>Criteria (from checksheet)</th>
<th>How course meets spirit (contextualize specific examples in next column)</th>
<th>Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. advance basic understanding of human interaction</td>
<td>The fundamental theme of the course is that energy sustainability is a social issue with a technological component</td>
<td>Modules 1, 4, 5, 7, 8, 9, and 11 specifically address human behavior, decisions, and institutions.</td>
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<tr>
<td>2. emphasizes the study of social behavior as found in geography, anthropology, etc.</td>
<td>The course is presented from an interdisciplinary social science perspective, not just one particular social science.</td>
<td>The social science disciplines represented in the course include geography, anthropology, economics, social psychology, political science, and sociology.</td>
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<tr>
<td>3. the distinct knowledge base of the social and behavioral sciences and 4. the use of social science perspectives and data</td>
<td>The course addresses common topics studied by social science such as decision-making, quality of life, international relations, policy and governance, economics, social institutions, cultural perspectives etc.</td>
<td>Modules 1, 4, 5, 7, 8, 9, and 11 specifically these topics.</td>
</tr>
</tbody>
</table>
Purpose
To provide students with the knowledge to make informed decisions about energy, and the concepts to understand how these decisions will affect their personal lives and the lives of others around the globe.

Course Description
This course follows the thread of energy through every aspect of our lives. It stresses the social, behavioral, and political contexts of energy. It addresses energy use throughout history, cultural differences in energy use, the influence of energy on quality of life, the role energy plays in political strategies and environmental quality, how it shapes our neighborhoods and cities, its contribution to our personal comfort and national security, and how these relationships are reflected in the worlds of business and the humanities.

The course emphasizes the following topics:

- Energy in history (including energy transitions such as during the industrial revolution)
- Energy in the arts (how it is expressed in music, painting, poetry, novels)
- The anthropology of energy (including how cultural differences affect energy decisions)
- The sociology of energy (including peer pressure, group dynamics)
- Energy in business (such as the impediments to energy start-up companies)
- Energy and politics (everything from making laws to making war)
- Energy behavior (including what motivates people to make their energy choices)
- Energy economics (such as calculating rate-of-return)
- Energy health and safety (everything from coal mining to nuclear accidents)
- Energy security (including how it affects decisions such as the Keystone XL pipeline)

Specific learning outcomes for each module in the course may be found on the course website.
Supporting Texts (readings will be assigned from these texts)


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**SCHEDULE**

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Topics</th>
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<tbody>
<tr>
<td>Module 1</td>
<td><strong>The Thread of Energy</strong></td>
</tr>
<tr>
<td>1.</td>
<td>The thread of energy and the fabric of our lives</td>
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<tr>
<td>2.</td>
<td>The history of energy transitions and how they have affected us</td>
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<tr>
<td>Module 2</td>
<td><strong>Energy and Society</strong></td>
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<tr>
<td>1.</td>
<td>Energy poverty and how it affects the quality of life</td>
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<td>Module 3</td>
<td>The Geopolitics of Energy</td>
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<tr>
<td>1.</td>
<td>The geopolitics of energy past and present</td>
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<td>2.</td>
<td>Geopolitics and national security</td>
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<tr>
<td>3.</td>
<td>The quest for energy and the wars it can produce</td>
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<table>
<thead>
<tr>
<th>Module 4</th>
<th>Energy in Our Daily Lives</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>How we use energy and why</td>
</tr>
<tr>
<td>2.</td>
<td>Energy and cars</td>
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<td>3.</td>
<td>The self-sufficient house</td>
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<table>
<thead>
<tr>
<th>Module 5</th>
<th>Energy Supplies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fossil fuels and our way of life (1st exam)</td>
</tr>
<tr>
<td>2.</td>
<td>The nuclear renaissance and what it would mean</td>
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<tr>
<td>3.</td>
<td>Social barriers to renewable energy</td>
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<td>4.</td>
<td>Meeting our energy needs through efficiency</td>
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<table>
<thead>
<tr>
<th>Module 6</th>
<th>Energy in the Built Environment</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Energy choice and urban design</td>
</tr>
<tr>
<td>2.</td>
<td>Energy use and architecture</td>
</tr>
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<td>3.</td>
<td>Energy and the operation of living spaces</td>
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<table>
<thead>
<tr>
<th>Module 7</th>
<th>The Choices we Make about Energy and Environment</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Energy or environment: Can we have both?</td>
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<tr>
<td>2.</td>
<td>Energy and wilderness: the growing battle over our national parks</td>
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<tr>
<td>3.</td>
<td>Energy and water: the critical tradeoffs (2nd exam)</td>
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<tr>
<td>Module 8</td>
<td>Energy Economics</td>
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<td>---------------</td>
<td>-------------------------------------------------------</td>
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<tr>
<td>1.</td>
<td>Energy in the world of business</td>
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<td>2.</td>
<td>What we pay for energy: externalities and how they are measured</td>
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<thead>
<tr>
<th>Module 9</th>
<th>Energy Politics and Policy</th>
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<tbody>
<tr>
<td>1.</td>
<td>Energy laws and how they are made</td>
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<td>2.</td>
<td>The role of policy decisions on the choices we have</td>
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<table>
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<tr>
<th>Module 10</th>
<th>Energy in the Arts</th>
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<tbody>
<tr>
<td>1.</td>
<td>Energy in music</td>
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<td>2.</td>
<td>Energy in film and the written word</td>
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<table>
<thead>
<tr>
<th>Module 11</th>
<th>Energy Sustainability</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Energy sustainability: myth or reality?</td>
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<tr>
<td>2.</td>
<td>Review and Discussion (Last day of class)</td>
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</tbody>
</table>

**Course Outcomes and Key Concepts**

This course is appropriate for students at any level, but it is aimed primarily at students early in their academic careers. It is meant to serve as an introductory exposure to energy which can serve as a foundation for more focused classes in energy issues within several colleges. The course is unique in that a holistic view of the various aspects of energy in society. Emphasis will be placed on providing a systems-thinking competence rather than any one specialized aspect of energy.

This course, as do all courses affiliated with the School of Sustainability, emphasizes the following themes:

**Systems Dynamics**
Social systems and environmental systems are linked. Changes in any part of any system have multiple consequences or *cascading effects* that reach far beyond the initial change. While some of the consequences of the decisions that we make are intended, *unintended consequences*, both positive and negative, are common.

**Scale**
Sustainability problems exist across multiple spatial scales. Solving a problem at a local level is a very different thing than solving a problem across international boundaries. Local activities might have impacts on other regions and even on the global scale.

**Long Term Development**
Sustainability hinges on an understanding of long-term consequences of the decisions that we make today. Solutions that work in the short term may pose problems over a longer time frame. Challenges that seem small in the present
**Tradeoffs**

There is no one “solution” to address sustainability. Solving almost all problems related to sustainability involves tradeoffs involving the socio-economic needs of multiple stakeholder groups and environmental capacities. There are rarely perfect solutions with no costs, and there are often winners and losers.

**Collaboration and Participation**

Sustainability problems are caused by, and affect, multiple stakeholders with specific experiences, resources, perspectives and preferences. Solving sustainability problems requires strong collaborations and negotiations among scientists of all disciplines, politicians, entrepreneurs, artists, farmers, business and community leaders, and you.

**Course Communication**

During the normal work week (M-F, 8am-5pm) I will try to respond to e-mails received promptly. I do not check e-mail as frequently during the weekend, so if you send a message to me after 5pm on Friday afternoon, do not expect a response until Monday. If you do not receive a response from me within 48 hours, please re-send your message as it may not have found its way to my inbox.

All communications (electronic and otherwise) that you have with me and your fellow students in this class should be professional. This means using proper grammar and sentence structure in your communication. Finally, always make sure that your inbox is not full and that your ASU email address (or forwarding account) is functioning properly, as I often distribute course communication through Blackboard’s announcements and email system which utilizes your ASU email address.

**Academic Integrity**

Cheating and plagiarism is not tolerated. This includes, but is not limited to using the ideas and material of others without giving due credit, and/or aiding another person to cheat either actively or passively (e.g., allowing someone to look at your exam/quizzes; writing someone’s paper for them). If a student is charged with academic dishonesty and found to be in violation, disciplinary action will be taken and a student’s name will be kept on file. Disciplinary action may result in the student receiving an XE on her or his transcript, suspension or expulsion from the academic unit and/or referral to Student Judicial Affairs. For further information, please read the Student Code of Conduct.

**Disability Accommodations**

If you need disability accommodations for this class, please contact me as soon as possible to allow us to work with the Disability Resource Center (http://www.asu.edu/studentaffairs/ed/drc/) to meet your needs. Information regarding disability is confidential.

**Sustaining Yourself**

Several offices on and off campus help students succeed at ASU. Please take advantage of these services as needed.

- **Computer Help Desk** provides assistance with computer-related problems and computer accounts. [https://help.asu.edu](https://help.asu.edu)
- **Counseling and Consultation** provides confidential mental health and career counseling services for all ASU students. [http://students.asu.edu/counseling](http://students.asu.edu/counseling)
- **Disability Resources** provides a comprehensive range of academic support services and
Center offers accommodations for qualified students with disabilities. 
http://www.asu.edu/studentaffairs/ed/drc

Student Financial Aid Office offers information and applications for student funding such as grants, loans, scholarships and student employment. 
http://students.asu.edu/node/40

Campus Health Service provides non-emergency medical health care to all ASU students. All insurance plans are accepted. http://students.asu.edu/health

Student Recreational Center offers individual and group fitness opportunities, as well as information on nutrition and wellness, and massages. Use of the general facilities (weights, circuit training and cardio machines) are free, other services (yoga classes, massages) are fee-based. 
http://src.asu.edu

Student Legal Assistance provides legal advice and counsel free of charge to all ASU students in areas such as landlord-tenant law, credit reports and collection issues, taxability of scholarships and grants, etc. Notary service is also available at no charge. http://www.asu.edu/studentaffairs/mu/legal

Writing Center provides on-site tutors to help students increase their confidence as writers and improve writing skills free of charge. For information, see http://studentsuccess.asu.edu/writing/

EMPACT Crisis Hotline offers free 24-hour support for mental health crises. Call (480) 784-1500 in the Phoenix area, (866) 205-5229 for the toll-free number outside of Phoenix, and (480) 736-4949 for the sexual assault hotline in Maricopa County. All services are free and confidential.
www.empact-spc.com

Course Website

- This course has an accompanying myASU website. Log in to the site at http://myasucourses.asu.edu/ using your ASURITE ID and password. You should see “GCU 194: The Thread of Energy”. The website contains the slides of lectures, reading materials for each topic, assignments, solutions, links, and email addresses for all in the class.
- **Note:** myASU uses your email address from ASU’s student records. This means that the students will have to check their ASU email, or have it forwarded to their preferred account, to get information sent from instructors or from their classmates.

Instructional Methods

Instruction will rely on mini-lectures, in-class exercises, guest speakers, assigned self-study, videos, and discussion of case studies. Written assignments, weekly journals and summary of guest oral presentations will enhance understanding and provide a proper appreciation of various facets of energy issues.
Grading Policy

ASU's +/- grading will be used: A+ (99%-100%), A (93-98%), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (70-76), D (60-69), E (<60), XE (failure due to academic dishonesty).

Final grades will be assigned on the basis of the following categories and according to the indicated weights:

<table>
<thead>
<tr>
<th>Category</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Quiz-1</td>
<td>20%</td>
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<tr>
<td>Quiz-2</td>
<td>20%</td>
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<tr>
<td>Final</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Prerequisites

There are no prerequisites for this course
Module 1.1 – THE THREAD OF ENERGY AND THE FABRIC OF OUR LIVES

- Learning Outcomes: After completing this unit, you should be able to:
  - Explain — How the energy needs and concerns weave through our lives in every possible way
  - Describe — Energy’s pervasive nature, how we use energy, and how reliant we are on its ceaseless provision

- Readings
  - Articles:
    - What everyone should know about energy: http://needtoknow.nas.edu/energy/
    - What you need to know about energy: http://www.eia.gov/energy_in_brief/

- In Class
  - Introduce the Topic – Why are we examining this?
  - Mini-lecture 1: The thread of energy
  - Activity 1: Discuss how energy affects you personally
  - Mini-lecture 2: The costs of energy
  - Activity 2: Discuss your individual expenditures on energy
  - Closure: Sum up, link to next class

- Homework
  - View the several short movies on energy located here: http://www.rationalmiddle.com/movies/preview/
  - Calculate the amount of energy you use when your electrical devices are off. Use the following (or equivalent) web sites:
    - Here’s the specific web site: http://standby.lbl.gov/summary-table.html.
    - Here’s the full web site: http://standby.lbl.gov/standby.html.

- Web sites
  - Energy Forms and Changes: energy_forms_and_changes.ppt
Module 1.2 – ENERGY TRANSITIONS: WHY WE CHANGE AND WHAT IT MEANS

- Learning Outcomes: After completing this unit, you should be able to:
  - Describe the energy transitions and their characteristics
  - Explain how and why energy resources we use change over time

- Readings
  - Part 1 – ‘Cultural Exchange’ in Brian Black


- In Class
  - **Introduction** - Why are we examining this?
  - **Mini Lecture 1** – Energy transitions – coming full circle
  - **Group Discussion** – Identify why energy transitions take place
  - **Mini Lecture 2** – What energy transitions might be next, and what the pros and cons are of such changes
  - **Closure:** Sum up, link to next class

- Homework
  - Web viewing
    - The Evolution of Energy Over History (< 7 minutes)
      [http://www.youtube.com/watch?v=eabmsuEZPs8](http://www.youtube.com/watch?v=eabmsuEZPs8)
    - History of Energy
      [http://blogs.discovery.com/a/6a00d8341bf67c53ef015437ee75c3970c-poped](http://blogs.discovery.com/a/6a00d8341bf67c53ef015437ee75c3970c-poped)
      (a summary graphic)
  - Prepare and submit in class a world map of critical places of principal energy transitions. (Find base maps on the web)

- Bibliography
  - *Energy in History* by Vaclav Smil
Module 2.1 – ENERGY POVERTY: EVERYONE DOESN’T LIVE THE WAY WE DO

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — What it is, where it is, what it is a problem we are facing
   b. Explain — How it happens, how it is manifest, what are its forms, what are the prospects of resolution, why we have to address it, what we are doing about it

2. Readings
   a. Articles:
      i. The worst kind of poverty: Energy poverty
         http://www.time.com/time/printout/0,8816,2096602,00.html.
      ii. Energy Poverty 101
         http://www.americanprogress.org/issues/2009/05/energy_poverty101.html

3. Videos:
   a. The Energy Poverty Challenge (~7 minutes)
      http://www.youtube.com/watch?v=1b9tr7be04g.
   b. A Light of Her Own (~2 minutes)
      http://www.youtube.com/watch?v=a2gRMHIzAIU.

4. In Class
   a. **Introduction** – Energy poverty is a hidden, yet pervasive, form of poverty that has several substantial implications for the present and future.
   b. **Mini-lecture 1** – What is energy poverty, what are its forms, where is it, how it happens, how it is manifest, what are its forms
   c. **Group Activity**: Identify general types of locations where energy poverty is likely in the U.S.
   d. **Mini-lecture 2** – Why we have to address it, what we are doing about it, what are the prospects of resolution
   e. **Group Activity**: Develop a policy for alleviating energy policy in the U.S.
   f. **Closure**: Sum up, link to next class

5. Homework

6. Bibliography
   b. *Curse of the Black Gold: 50 Years of Oil in the Niger Delta* by Ed Kashi and Michael Watts, 2010
Curse of the Black Gold: 50 Years of Oil in the Niger Delta takes a graphic look at the profound cost of oil exploitation in West Africa. Featuring images by world-renowned photojournalist Ed Kashi and text by Nobel Laureate Wole Soyinka, prominent Nigerian journalists, human rights activists, and University of California at Berkeley professor Michael Watts, this book traces the 50-year history of Nigeria's oil interests and the resulting environmental degradation and community conflicts that have plagued the region. Now one of the major suppliers of U.S. oil, Nigeria is the sixth largest producer of oil in the world. Set against a backdrop of what has been called the scramble for African oil, Curse of the Black Gold is the first book to document the consequences of a half-century of oil exploration and production in one of the world's foremost centers of biodiversity. This book exposes the reality of oil's impact and the absence of sustainable development in its wake, providing a compelling pictorial history of one of the world's greatest deltaic areas. Accompanied by powerful writing by some of the most prominent public intellectuals and critics in contemporary Nigeria, Kashi's photographs capture local leaders, armed militants, oil workers, and nameless villagers, all of whose fates are inextricably linked. His exclusive coverage bears witness to the ongoing struggles of local communities, illustrating the paradox of poverty in the midst of plenty.


One of the consequences of the post-socialist transformation of Eastern and Central Europe and the former Soviet Union is the emergence of energy poverty, a condition where households are living in inadequately heated homes. Winter after winter, the world's media file reports about energy-related humanitarian emergencies: 'Dozens die in Russian cold snap' in January 2006 being simply the latest as every spell of unusually cold weather brings misery to some countries in the region, as millions are left without heating and electricity. This book provides the first full-length examination of the causes, consequences and patterns of energy poverty in former Communist countries. Based on empirical evidence that spans different spatial contexts and scales and compares these with other developing regions, it links household-level deprivation with broader organizational and political dynamics. The book also analyses the lived experiences of scarcity and marginalization at household level. It identifies the socio-demographic factors that distinguish energy-poor families from the rest of the population, and the need for addressing energy poverty through a comprehensive range of policy tools. As the issue of energy supply from the former Soviet Union is likely to become a burning economic and political problem across the whole of Europe within the next couple of decades, the book argues that there is a direct link between the energy crises experienced by the region, and the social aspects of energy use in households.


Energy Keepers Energy Killers: The New Civil Right Battle exposes the wrongs done to the poor and minorities by environmental and political elites trying to eradicate fossil fuel production - coal, oil, and gas - supposedly to "save the world from global warming." Author Roy Innis, national chairman of the Congress of Racial Equality, shows how their wrongheaded policies price energy out of reach and violate the civil rights of all Americans, but hurt the poor and minorities worst. Innis demands an end to this "energy racism" and calls for the opening of all federal lands - which belong to the disadvantaged as much as to well-funded environmental leaders - to more energy production in a sustained campaign to increase supply and lower prices. Innis reveals the flaws in global warming hysteria and makes the stunning fact clear in his "Energy Reality" chart that so-called "alternative energy" from wind and solar power actually provided less than one-half of one percent of America's energy needs in 2006. "It's a supplement, not an alternative," Innis says. If we let politicians keep killing off fossil fuels - which give us over 80% of all our present energy - we will deliberately drive ourselves into "the Energy Gap," counting on "alternatives" that do not exist. Innis concludes that current congressional energy policy to kill off fossil fuel production virtually amounts to national suicide and must be prevented at all costs.
Module 2.2 – THE ROLE OF CULTURE IN ENERGY DECISIONS

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — What culture influence our energy choices
   b. Describe — Where cultural difference influence energy choices

2. Readings

3. In Class
   a. Introduction: why is culture important?
   b. Group Activity: identify alternative approaches to the value of energy
   c. Mini-lecture 1: energy provision in different cultures
   d. Group Activity: identify the differences in the value of energy among your classmates
   e. Mini-lecture 2: the relative value of energy in different cultures

4. Bibliography
   a. Crude Domination: An Anthropology of Oil, by Behrends, Reyna and Schlee.
   b. Energy and Society, by Harold H. Schobert
Module 2.3 - ENERGY SECURITY AND WHAT WE DO TO MAINTAIN IT

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain --- the relationship of security to energy decisions, policy, costs, and use
   b. Describe --- examples of how energy security affects energy supply and futures

2. Readings
   b. BlackBoard
      i. Martin J. Pasqualetti and Benjamin Sovacool. The Importance of Scale to Energy Security. Journal of Integrative Environmental Sciences, 9(3):167-180
   c. Articles:
      i. “Obama Administration Announces New Investments to Advance Biofuels Industry and Enhance America’s Energy Security”
         (http://energy.gov/articles/obama-administration-announces-new-investments-advance-biofuels-industry-and-enhance)

3. Videos
   a. Increasing renewable energy
      http://www.youtube.com/watch?v=1cysaOnly_E&playnext=1&list=PLAAF2C469FCA19E40&feature=results_main.
   b. Solar power tower (proposed for Arizona) -
      http://www.youtube.com/watch?v=0tWIP0knKQU&feature=related
   d. Increasing production of conventional fuel-
      http://www.youtube.com/watch?v=fnsBU_XWQJ8&feature=BFa&list=PLAAF2C469FCA19E40

4. In Class
   a. Introduction: Why are we examining this?
   b. Group discussion: How does energy security affect personal lives?
   c. Mini-lecture 1: The multiple aspects of energy security
   d. Group discussion: How can we increase our energy security?
   e. Mini-lecture 2: The future of renewable energy
   f. Closure: Sum up, link to next class
5. Homework
   a. Identify how your personal security is dependent upon a secure supply of energy.
6. Bibliography
Module 2.4 – MATCHING ENERGY AND SOCIETY

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — in addition to poverty and security, how energy affects society
   b. Describe — social conditions in Appalachia, Boomtowns in the western U.S.,
      home energy use

2. Readings
   a. Article: Booming Bakken town struggles to adapt as 'Gillette syndrome' sets in
      http://eenews.net/public/energywire/2012/06/04/2

3. Web sites
      http://www.youtube.com/watch?v=XbGg57r9wK0&feature=related.
   c. Kilowatt Ours — a film by Jeff Barrie. Introduction -
      http://www.youtube.com/watch?v=pMh336EZpuI&feature=relmfu
   d. Larry Gibson works his mountain -
      http://www.youtube.com/watch?v=QqFporYGI8o&feature=youtu.be

4. In Class
   a. Introduction – Why are we examining this?
   b. Discussion of assignment on the costs of personal energy use
   c. Mini-lecture 1 – energy and society, GDP per capita and Appalachia
   d. Group activity – what are the ways we use energy at home?
   e. Mini-lecture 2 – saving energy at home
   f. Closure: Sum up, link to next class

5. Homework
   a. Come to class with an estimate of your annual monetary expenditures on energy.
      This should include at least the following: (1) transportation fuel, (2) heating and
      cooling. Also consider other energy expenditures that come to mind, such as
      flights, mass transit, and the energy embodied in the products you use.

6. Bibliography
   a. Harry Caudill. Night Comes to the Cumberlands: A biography of a depressed
      area.
   c. Kai T. Erikson. Everything in its Path: Destruction of community in the Buffalo
      Creek Flood.
   e. Wyoming-based documents on boomtowns:
   f. Home-energy audits:
      i. Home Energy Check-up (ACEE):
         http://www.ase.org/checkup/home/main.html
ii. On-Line Home Energy Audit (ICLEI):
http://www.iclei.org/audit/index.htm
Module 3.1 – HOW WE USE ENERGY AND WHY

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — What energy resources are available and who uses which
   b. Explain — Why there are geographical differences between supply and demand

2. Web sites
   a. BP World Energy Report

3. Videos
   a. Global energy snapshot -

4. In Class
   a. Introduction: Why are we examining this?
   b. Mini-lecture 1: Our global energy portfolio
   c. Activity: What is our current global energy mix?
   d. Mini-lecture 2: What does the portfolio mean for our health and security
   e. Activity: How and why might our energy portfolio change in the future?
   f. Closure: Sum up, link to next class

5. Homework
   a. Compare Arizona’s energy supplies with any other state and explain what you can infer from this comparison. Consider using pie charts for the comparison. There are many sources on the internet that can help on this.
Module 3.2 – GEOPOLITICS AND NATIONAL SECURITY

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — Spatial factors that accompany the distribution of energy resources and energy demand
   b. Explain — How and why these factors are important to energy security, environmental justice, transfer of wealth, and what we can do about it

2. Readings
   a. Web sites:
      i. http://www.eia.gov/countries/ - this is an interactive map that will allow you to identify sources of various energy resources, plus a briefing of every country’s energy picture
   b. Text
      i. Yergin: All of part two

3. Videos

4. In Class
   a. Introduce the Topic – Why are we examining this?
   b. Mini-lecture 1: essential elements resulting from the geography of energy
   c. Activity: draw a supply chain for gasoline used by a typical American consumer
   d. Mini-lecture 2: what might the future geography of energy hold and what will be its impacts
   e. Activity: What are the implications of oil trading patterns
   f. Closure: Sum up, link to next class

5. Homework
   a. Write up to one page on the implications of these trading patterns

6. Bibliography
a. The complex network of global cargo ship movements, by Pablo Kaluza, Andrea Kölzsch, Michael T. Gastner and Bernd Blasius.

http://rsif.royalsocietypublishing.org/content/early/2010/01/19/rsif.2009.0495.full
Module 3.3 – ENERGY AND WAR

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — why and how conflicts over energy resources can lead to war
   b. Describe — examples of energy wars in Persian Gulf, Nigeria

2. Readings
   a. ‘Against…Domination’: Oil and War in Chechnya, by Galina Khizriyeva and
      Stephen P. Reyna. In *Crude Domination: An Anthropology of Oil*
      Michael Watts. In *Crude Domination: An Anthropology of Oil*

3. Videos
   a. The Fires of Kuwait - [http://www.youtube.com/watch?v=UrYJoUYRZ7U](http://www.youtube.com/watch?v=UrYJoUYRZ7U)
   b. Gulf War
      i. [http://www.youtube.com/watch?v=sIlGF948aDU](http://www.youtube.com/watch?v=sIlGF948aDU)
      iii. [http://www.youtube.com/watch?v=TvaU3ZiBmGw](http://www.youtube.com/watch?v=TvaU3ZiBmGw)
      iv. [http://www.youtube.com/watch?v=97RnsZfc_5Q](http://www.youtube.com/watch?v=97RnsZfc_5Q)

4. In Class
   a. Introduction:
   b. Group Activity: identify why energy wars can occur
   c. Mini-lecture 1: energy wars in Persian Gulf
   d. Group Activity: identify how energy wars can be avoided
   e. Mini-lecture 2: energy wars in Nigeria
   f. Closure
Module 4.1 – ENERGY USES IN OUR COUNTRY AND OUR HOMES

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — How we use energy in our homes and country
   b. Explain — The sectors of energy demand, the forms of energy supply, how energy characteristics are matched to their use

2. Readings
   a. How to reduce home energy consumption:
      http://www.aceee.org/consumer/building-envelope
   b. 10 ways to reduce your home energy use
      http://www.blogs.theblotspot.co.uk/207/03/23/10-no-cost-ways-to-reduce-energy-use-in-your-home/
   c. 100 ways to save energy
      http://guelph.ca/living.cfm?itemid=787862nd127

3. In Class
   a. Introduction: Why are we examining this?
   b. Mini-lecture 1: National energy use
   c. Activity: What does this diagram tell you?

4. Primary Energy Consumption By Source and Sector, 2011
   quadrillion Btu

5. d. Mini-lecture 2: Residential energy use and energy efficiency
   e. Activity: Calculating your energy costs
   f. Closure: Sum up, link to next class

4. Homework
   a. Do a home energy audit. Use either of the following calculators to determine how much you could save. You may use a surrogate home for the analysis if you wish.
      i. Electrical Energy Cost Calculator
         http://www.csguniversity.com/elecenergywebcalc.html
      iii. Energy Star
         http://www.energystar.gov/index.cfm?fuseaction=home_energy_advisor.showGetInput
iv. Home Energy Check-up (ACEE):
   http://www.ase.org/checkup/home/main.html
v. On-Line Home Energy Audit (ICLEI):
   http://www.iclei.org/audit/index.htm
vi. Building Envelopes Program (ORNL):
vii. DOE-2: http://www.doe2.com/
viii. eQuest: http://doe2.com/equest/index.html

5. Bibliography
   b. The major sources and users of energy in the United States.
      http://www.eia.gov/energy_in_brief/major_energy_sources_and_users.cfm
Module 4.2 – ENERGY USE IN TRANSPORTATION

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — The relationships of energy and transportation
   b. Explain — How energy is used in transportation and how to decrease this use

2. Readings
   a. Web sites:
      i. Alternative Fuels Data Center - http://www.afdc.energy.gov/fuels/

3. Videos
   a. Amory Lovins’ Hyper Car - http://www.youtube.com/watch?v=8D-uhKHy7mk&feature=related

4. In Class
   a. Introduction – Why are we examining this?
   b. Mini-lecture 1 – What is the picture of energy use in transportation?
   c. Group Activity – Identify what you can do to save transportation fuel
   d. Mini-lecture 2 – What can we do to use less energy?
   e. Group Activity – How much can you save?
      http://www.afdc.energy.gov/conserve/
   f. Closure: Sum up, link to next class

5. Bibliography
Module 4.3 – THE SELF-SUFFICIENT HOUSE

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — the major commitment of energy we make in how we design and operate our houses
   b. Describe — how to make a self-sufficient house

2. Readings: lecture and discussion

3. Videos: TBA

4. In Class
   a. Introduction: energy used in buildings
   b. Group Activity: identify how energy links with house architecture
   c. Lecture 1: what is a net-zero house?
   d. Group Activity: identify how energy links with house operation

5. Homework
   a. Readings
   b. TED Talk
   c. Kahn Academy
   d. YouTube
   e. Videos:
      f. Case Study: Calculate how much energy you use in your residence each year. (You may use someone else’s house as the case study if necessary.) Break your calculations into categories and arrive at a total. Use the web site below (or another one if you prefer):

6. Bibliography
   a. Amory Lovins on buildings (see BlackBoard)
Module 5.1 – ARE THERE FOSSILS IN FOSSIL FUELS?

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — what fossil fuels are
   b. Explain — the nature of fossil fuels, what we use them for, and their relative characteristics

2. Readings
   b. 300 Years of FOSSIL FUELS in 300 Seconds
      (http://www.youtube.com/watch?v=cJ-J91SwP8w)

3. In Class
   a. Introduction - Why are we examining this?
   b. Mini-lecture 1 – What are fossil fuels?
   c. Activity – Identify the pros and cons of each fossil fuel
   d. Mini-lecture 2 – What are the characteristics of developing each fuel?
   e. Activity – What are the benefits of a North American energy alliance?
   f. Closure: Sum up, link to next class

4. Homework
   a. YouTube: Fracking Hell: The Untold Story
      http://www.youtube.com/watch?v=dEB_Wwe-uBM&feature=related (17:53)

5. Bibliography
   a. Crude Oil (http://www.youtube.com/watch?v=BVII3CcmgZE&feature=related)
   b. History of Oil (Part 1) (http://www.youtube.com/watch?v=D4sykoUWZ8g&feature=related)
   c. History of Oil (Part 2) (http://www.youtube.com/watch?v=9TfRH-atfLQ&feature=relmfu)
   d. History of Oil (Part 3) (http://www.youtube.com/watch?v=WDkvhPGHwkk&feature=relmfu)
   e. History of Oil (Part 4) (http://www.youtube.com/watch?v=nJDaeQbRL_k&feature=relmfu)
   f. History of Oil (Part 5) (http://www.youtube.com/watch?v=WtNtlQ2Gso0&feature=relmfu)
Module 5.2 – CAN THE WORLD SURVIVE WITHOUT NUCLEAR POWER?

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — the pros and cons of nuclear power
   b. Describe — the history and development of nuclear power

2. Videos
   b. Chernobyl (Ukraine, April 26, 1986)
      ii. Greenpeace video on Chernobyl - http://www.youtube.com/watch?v=3u_8frR0lpE (5:00)
      iv. Ghost city of Chernobyl - http://www.youtube.com/watch?v=gpoVzIAbUN0&feature=related (5:54)
   c. Fukushima (Japan - March 12, 2011)
      ii. "They Lied To Us." Fukushima Still A Ticking Time Bomb - http://www.youtube.com/watch?v=kXxmy6R3m90&feature=related (5:07)

3. In Class
   a. Introduction – Why are we examining this topic?
   b. Mini-lecture 1 – The context of nuclear power
   c. Group Activity – Take a position on nuclear power, either pro or con and be prepared to present and defend your position
   d. Mini-lecture 2 – The pros and cons of nuclear power
   e. Closure – Sum up, link to next class

4. Homework
   b. 5 minute introduction to thorium http://www.youtube.com/watch?v=uK367T7h6ZY
Module 5.3 – THE BARRIERS TO RENEWABLE ENERGY ARE SOCIAL (and perhaps more)

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — How social barriers can inhibit the development of renewable energy
   b. Describe — Several examples of such barriers to geothermal, solar and wind

2. Readings
   a. Articles:
      ii. The Ultimate Corporation:
   b. Web sites:
      i. http://www.withouthotair.com/

3. In Class
   a. Introduction – The need to transition to renewable energy
   b. Mini-lecture 1 – The customary reliance on technology
   c. Group Activity – As groups of 3, identify potential social barriers to renewable energy
   d. Mini-lecture 2 – The social barriers to renewable energy
   e. Group Activity – As groups of 3, identify how such barriers are mitigated?
   f. Closure: Sum up, link to next class

4. Homework

5. Bibliography
Module 5.4 – MEETING OUR ENERGY NEEDS THROUGH EFFICIENCY

Learning Outcomes: After completing this unit, you should be able to:

a. Explain — How energy efficiency is better than providing new supplies
b. Describe — Why energy efficiency is easy, easy, easy to imagine

2. Readings

a. Article:
      http://apps1.eere.energy.gov/news/progress_alerts.cfm/pa_id=762

3. Videos

a. Energy efficiency – The World by 2030
   http://www.youtube.com/watch?v=QG3HNQjEaTM (< 5 minutes)
b. Eco-Principle 3: Energy efficiency -
   http://www.youtube.com/watch?v=Fj2m6pYr3Fw&feature=fvwrel (3 min)

4. In Class

a. Introduce the Topic – How can we get what we want with harming the environment and our wallet?
b. Activity: Identify the benefits of energy efficiency
c. Mini-lecture 1 – Energy efficiency as a resource
d. Activity: Identify how to be more energy efficient in transportation and buildings
e. Mini-lecture 2 – Energy efficiency in buildings, transportation and planning
f. Closure: Sum up, link to next class

5. Homework

a. Organizations. Look at the web sites of these two organizations:
   i. American Council for Energy Efficiency Economy (ACEEE) (This is the URL for energy efficiency jobs and it has links to much more):
   ii. SouthWest Energy Efficiency Project (SWEEP)

6. Bibliography

b. SWEEP. 2012. *The $20 Billion Bonanza* (on BlackBoard)
Module 6.1 – ENERGY’S ROLE IN THE FORM AND FUNCTION OF CITIES

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — The urgent need for more sustainable cities
   b. Describe — The energy element of a sustainable city
2. Readings/BlackBoard
   a. Tomorrow’s City – the urban energy enigma -
      http://www.youtube.com/watch?v=5T2kJMwU9Y
   b. The Future of Sustainable Cities & Energy -
      http://www.youtube.com/watch?v=hhA1X7ZqKYA
3. In Class
   a. Introduction – The need for sustainable cities
   b. Group Activity – Identify the ties between energy and the form and function of cities
   c. Mini-lecture 1 - the central theme of energy in the form and function of cities
   d. Group Activity – What can we do on the energy front to create more sustainable cities?
   e. Mini-lecture 2 – Cities of the future
   f. Closure: Sum up, link to next class
4. Homework
   b. TED Talk
      i. James Kunstler: How bad architecture wrecked cities -
         http://www.ted.com/talks/james_howard_kunstler_dissects_suburbia.html (~ 20 minutes)
   c. YouTube
      i. Douglas Farr - Sustainable Urbanism: Urban Design with Nature -
         http://www.youtube.com/watch?v=uSjurs4ZnlM&feature=related (1:20:22)
5. Bibliography
Module 6.2 – ENERGY USE AND ARCHITECTURE

- Learning Outcomes: After completing this unit, you should be able to:
  - Explain — How energy is used in buildings and how important it is that we reduce that energy demand
  - Describe — How we can reduce energy use in buildings

- Video: Green Building Design

- In Class
  - Introduction - The use of energy in buildings in greater than you think.
  - Mini-lecture 1 – How energy is used in building
  - Activity – Working in pairs, identify and categorize the energy using devices you have in your residences.
  - Mini-lecture 2 – How energy in buildings can be reduced
  - Activity – Working in pairs, identify the general categories of how you could reduce energy use in your residences
  - Closure: Sum up, link to next class

- Homework
  - Readings
  - TED Talk
  - Case Study: Calculate how much energy you use in your residence each year. (You may use someone else’s house as the case study if necessary.) Break your calculations into categories and arrive at a total. Use the web site below (or another one if you prefer):

- Bibliography
  - Amory Lovins on buildings (see BlackBoard)
Module 6.3 – ENERGY AND THE OPERATION OF LIVING SPACES

Learning Outcomes: After completing this unit, you should be able to:

- Explain — The importance of the use of energy in individual houses
- Describe — How houses can be designed and operated to reduce energy

- Readings

  - Web sites:

  - Videos
    - Amory Lovins on Building. (download or view from http://www.rmi.org/Stanford%20Energy%20Lectures (1 hour 36 minutes))

- In Class

  - Introduce the Topic – Why are we examining this?
  - Mini-lecture 1 – How houses use energy
  - Think-Pair-Share Activity or Group Activity: Identify the energy uses in your residences and calculate how much it is costing you.
  - Mini-lecture 2 – How energy use in houses can be reduced to zero
  - Think-Pair-Share Activity or Group Activity: Identify how you could reduce energy uses in housing in the Phoenix area
  - Closure: Sum up, link to next class

- Homework

  - Readings
Module 7.1 – ENERGY OR ENVIRONMENT: CAN WE HAVE BOTH?

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — The relationships between energy and air quality
   b. Describe — What we can do to clean our air

2. Readings
   a. Article: Amory Lovins, “Drilling in all the wrong places” (on BlackBoard)

3. Videos
   a. Symphony of Science - Our Biggest Challenge (Climate Change Music) -
      http://www.youtube.com/watch?v=HHP9Rh-ooh0
   b. The Most Terrifying Video You'll Ever See -
      http://www.youtube.com/watch?v=ZOv8wwiadQ
   c. Drilling in all the wrong places (making efficient cars) –
      http://www.youtube.com/watch?v=UnRoB4J0Yu4

4. In Class
   a. Introduction – Our need for clean air
   b. Group Activity – identify how our energy needs affect air quality
   c. Mini-lecture 1 –the impacts of dirty air
   d. Group Activity – identify how we can clean our air (technical and behavioral)
   e. Mini-lecture 2 – cleaning our air
   f. Closure – Sum up, link to next class

5. Homework
   a. Bill McKibben on Sandy and Climate Change: "If There Was Ever A Wake-up Call, This Is It" - http://www.youtube.com/watch?v=moqpiHhmjs
Module 7.2 – ENERGY AND WILDERNESS: THE GROWING BATTLE OVER OUR NATIONAL PARKS

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — The threats that energy demand poses on wilderness, both from the perspective of supply and demand
   b. Explain — Where this is happening and what can be done in response

2. Readings
   a. Web sites: The Wilderness Within Us - http://wildnesswithin.com/ (This site provides a wide spectrum of links to wilderness and what it means)

3. Videos
   a. The Wilderness Society's Better Energy video -
      http://www.youtube.com/watch?v=r_tys6u2XsI (< 4 minutes)
   b. Plundering Appalachia - The Tragedy of Mountaintop-Removal Coal Mining.
      http://www.youtube.com/watch?v=VoOIB3_7bzU&feature=related. (~10 minutes)
   c. Arctic National wildlife Refuge -
      http://www.youtube.com/watch?v=FXvLh5YaBoe&feature=related

4. In Class
   a. Introduction – Why are we examining this?
   b. Group Activity – What are the energy threats to wilderness?
   c. Mini-lecture 1 – The threats themselves throughout the fuel chain
   d. Group Activity – What can be done to reduce the conflict?
   e. Mini-lecture 2 – Possible measures
   f. Closure: Sum up, link to next class

5. Homework
   a. Readings
      i. Drilling controversy in ANWR -

6. Bibliography
Module 7.3 – ENERGY AND WATER: THE CRITICAL TRADEOFF

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — Why energy, water and land use have to be considered as one theme
   b. Describe — Examples of how energy, water, and land use interact to influence desert life

2. Readings
   a. Martin Pasqualetti “Water and Energy in the Southwest” (on BlackBoard)
   b. Martin Pasqualetti “The Water Bargain of Solar and Wind Power” (on BlackBoard)

3. Videos
   a. Water Scarcity & Energy Demand in China (< 2 min)
      http://www.youtube.com/watch?v=zAIwTghx76M&feature=related
   b. WSCJ 2011: Energy, Water and Food Nexus: The Science of Optimization and Sustainability (~ 2 min)
      http://www.youtube.com/watch?v=bCcORJZPZw&feature=related.

4. In Class
   a. Introduction – Why are we examining this?
   b. Mini-lecture 1 – What is the water/energy nexus?
   c. Group Activity – How is water, energy, and land use linked in the desert?
   d. Mini-lecture 2 – The problems with water used in power production in the desert
   e. Group Activity – How can we better approach the water demands of energy in the desert?
   f. Closure: Sum up, link to next class

5. Homework
   a. Identify what actions you can take to save water and energy. Estimate how much of each you might be able to save by taking these actions.

6. Bibliography
   a. The Water-Energy Nexus (48 min.)
      http://www.youtube.com/watch?v=_wLYYq8vo9A&feature=related
   b. The Water/Energy Nexus (1:29)
      http://www.youtube.com/watch?v=KQZQ1_q6QUA&feature=related
Module 8.1 – WHAT WE PAY FOR ENERGY

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — what we pay for energy, including life-cycle analysis and externalities
   b. Describe — the types and purposes of energy businesses

2. Readings
   a. Chapter 1 in *Energy Law in a Nutshell*, by Tomain and Cudahy

3. In Class
   a. Introduction – Why are we examining this?
   b. Group Activity: Identify which businesses are involved in providing energy
   c. Mini-lecture 1: The business of energy
   d. Group Activity: Identify the training necessary to work in this industry
   e. Mini-lecture 2: How the business of energy might change in the future
   f. Closure: Sum up, link to next class

4. Bibliography
      Published bi-monthly • ISSN 0144-5987. RSS\(^1\) feeds are available through the ASU library.

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\(^1\) RSS [Rich Site Summary](originally RDF Site Summary, often dubbed **Really Simple Syndication**) is a family of web feed formats used to publish frequently updated works—such as blog entries, news headlines, audio, and video—in a standardized format
Module 8.2 – ENERGY IN THE WORLD OF BUSINESS

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — How important energy is in business
   b. Describe — How a grocery store can use less energy

2. Readings
   a. Website: Texas Grocer Slashes Energy Use
      http://www.rmi.org/texas_grocer_slashes_energy_use_esj_article

3. In Class
   a. Introduction – Why are we examining this?
   b. Mini-lecture 1 – Energy in Business
   c. Group Activity: Consider how to save energy in a grocery store
   d. Mini-lecture 2: Energy efficiency in grocery stores
   e. Group Activity: Consider what other businesses use a lot of energy
   f. Closure: Sum up, link to next class

4. Homework
   a. Identify energy businesses with the metropolitan Phoenix area and identify the ingredients the contribute to their success or possible failure
Module 9.1- ENERGY LAWS AND HOW THEY ARE MADE

Learning Outcomes: After completing this unit, you should be able to:

a. Explain — the process of developing energy legislation
b. Describe — examples of the interplay of energy and law

2. Readings
   a. Text: Chapter 3 in *Energy Law in a Nutshell*
   b. Articles:
      i. USA's interest in Caspian Sea oil to bring more trouble to Russia, http://english.pravda.ru/world/asia/05-06-2009/107728-caspian_sea-0/#

3. Videos
   a. Darfur and China - Oil vs. Genocide - http://www.youtube.com/watch?v=uL9r5DYK54s
   b. Chad-Cameroon Pipeline: Crude Awakening – http://www.youtube.com/watch?v=uqduGx7lik4
   c. Azerbaijan - http://www.youtube.com/watch?v=9nRQIO9SD0&feature=player_embedded

4. In Class
   a. Introduction – Why are we examining this?
   b. Group Activity – what are the links between energy and politics?
   c. Mini-lecture 1 - Considerations
   d. Group Activity – what are examples of the politics of energy?
   e. Mini-lecture 2 – Case studies
   f. Closure: Sum up, link to next class

5. Bibliography
   d. Michael T. Klare
ii. Blood and Oil: The dangers and consequences of America's growing dependency on imported petroleum, 2004
Module 9.2 – THE ROLE OF POLICY IN ENERGY CHOICES

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Describe — The role of policy on solar energy development
   b. Explain — What policy is, the role of policy, how policies are developed, existing solar energy policies, the barriers to solar energy policy, the drawbacks to solar energy policy, the future role of solar energy policy

2. Text: Chapter 2 and Chapter 3 in Energy Law in a Nutshell

3. Videos
   b. Japan to review nuclear energy policy – http://www.youtube.com/watch?v=VOVru9Vkik4
   c. India Embraces Solar Energy - http://www.youtube.com/watch?v=5b5RX4Rz_U&playnext=1&list=PL9BDF859621F87642&feature=results_main
   d. Former Colorado Governor Talks Energy Policy and Why Coal is Still Necessary - http://www.youtube.com/watch?v=5BYThbauPRg

4. In Class
   a. Introduce the Topic – Why are we examining this?
   b. Mini-lecture 1 – what can policies accomplish?
   c. Group Activity - Identify several policies that affect your personal life
   d. Identify several policies that affect your professional life
   e. Mini-lecture 2 – What are examples of policies?
   f. Group Activity - Construct arguments for and against the implementation of FITs in Arizona
   g. Closure: Sum up, link to next class
Module 10.1 – ENERGY IN MUSIC

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — Why energy is reflected in the arts
   b. Describe — How energy is reflected in the arts, what it tells us about the costs of energy, how it reflects social conditions

2. Music performances
   - “Paradise” by John Prine:
     http://www.youtube.com/watch?v=bDCsc3CU5ww&feature=related

Muhlenberg (Central City to be exact) was home to John Prine, Merle Travis, The Everly Brothers, and so many more influential musicians originated here. And Peabody coal company still stands today. If you ever make it there, all you'll see on the road is coal trucks. It's a great rural county, and this song describes it perfectly.

![Image](Figure 1 - TVA's Paradise Fossil Plant)

- “16 Tons”
  - by Tennessee Ernie Ford - http://www.youtube.com/watch?v=Joo90ZWrUkU
  - by Merle Travis:
    http://www.youtube.com/watch?v=Jcbn_unVhRU&feature=related
  - by Eric Burdon: http://www.youtube.com/watch?v=E6m1qgnUw74
o by Johnny Cash: http://www.youtube.com/watch?v=ot993G2aFek
• “Black Lung” by Hazel Dickens, performed by Kathy Mattea - http://www.youtube.com/watch?v=3RVVVSCR2I8
• “Ludlow Massacre” by Woodie Guthrie: http://www.youtube.com/watch?v=XDd64suDz1A
• “The Coal Miner Song” - Jimmy Joe Lee: http://www.youtube.com/watch?v=hyK5MFvw3r4

3. In Class
   a. Introduce the Topic – Why are we examining this?
   b. Mini-lecture 1 - energy in the arts
   c. Activities:
      i. Provide examples of how energy reflect the arts in your experience
      ii. Create lists of movies, books, art, music or other arts that reflect energy in some way
      iii. Explains why energy is reflected in the arts
   d. Mini-lecture 2 – energy in music
      i. Activity
   e. Closure: Sum up, link to next class

4. Homework
16 tons (by Merle Travis)

Some people say a man is made outta mud
A poor man's made outta muscle and blood
Muscle and blood and skin and bones
A mind that's a-weak and a back that's strong

You load sixteen tons, what do you get?
Another day older and deeper in debt
Saint Peter don't you call me 'cause I can't go
I owe my soul to the company store

I was born one mornin' when the sun didn't shine
I picked up my shovel and I walked to the mine
I loaded sixteen tons of number nine coal
And the straw boss said "Well, a-bless my soul"

You load sixteen tons, what do you get?
Another day older and deeper in debt
Saint Peter don't you call me 'cause I can't go
I owe my soul to the company store

I was born one mornin', it was drizzlin' rain
Fightin' and trouble are my middle name
I was raised in the canebrake by an ol' mama lion
Can't no-a high-toned woman make me walk the line

You load sixteen tons, what do you get?
Another day older and deeper in debt
Saint Peter don't you call me 'cause I can't go
I owe my soul to the company store

If you see me comin', better step aside
A lotta men didn't, a lotta men died
One fist of iron, the other of steel
If the right one don't a-get you, then the left one will
You load sixteen tons, what do you get?
Another day older and deeper in debt
Saint Peter don't you call me 'cause I can't go
I owe my soul to the company store

Coal Miner’s Daughter (lyrics)

Well, I was born'd a coal miner's daughter,
In a cabin, on a hill in Butcher Holler,
We were poor, but we had love,
That's the one thing that daddy made sure of,
He shoveled coal t' make a poor man's dollar.

[Well, I was born'd a coal miner's daughter,
In a cabin, on a hill in Butcher Holler,
We were poor, but we had love,
That's the one thing that daddy made sure of,
He shoveled coal t' make a poor man's dollar.]

My daddy worked all night in the Van Lear Coal Mines,
All day long in the field a-hoein' corn,
Mommy rocked the babies at night,
And read The Bible by the coal-oil light,
Everything would start all over come break of morn'.

Daddy loved and raised eight kids on a miner's pay,
Mommy scrubbed our clothes on a washboard every day,
Why, I seen her fingers bleed, to complain, there was no need,
She'd smile in mommy's understanding way.

In the summertime we didn't have shoes to wear,
But in the wintertime, we'd all get a brand new pair,
From a mail-order catalog, money made from sellin' a hog,
Daddy always managed to get the money somewhere.

Yeah, I'm proud to be a coal miner's daughter,
I remember well the well where I drew water,
The work we done was hard, at night we'd sleep 'cause we were tired,
I never thought of ever leavin' Butcher Holler.

Well, a lot of things have changed since a'way back then,
And it's so good to be back home again,
Not much left but the floors, nothin' (alt: no one) lives here anymore,
'Cept the memories of a coal miner's daughter.
Module 10.2 – ENERGY IN FILM, PAINTING AND WRITING

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — How energy is represented in writing, painting, photography, and movies
   b. Describe — Examples of energy in writing, painting, photography, and movies

2. Text:
   a. Any 15 poems from Coal: A Poetry Anthology
   b. Chaps 1, 3, 10, 13 in Caverns in the Night: Coal Mines in Art, Literature and Film

3. Videos
   a. Howard Zinn on the Ludlow Massacre (documentary) (2 minutes)
   b. Algae Arts: http://theatrescience.wikispaces.asu.edu/Algae+Arts

4. In Class
   a. Introduction – energy in the arts (part 2)
   b. Mini-lecture 1 – Where we find energy represented in the arts (besides music)
   c. Activity – Identify movies on an energy theme
   d. Mini-lecture 2
   e. Closure: Sum up, link to next class

5. Bibliography
   a. Movies
      i. Meltdown at Three Mile Island, A PBS documentary: 1999, Call #: E741.A74x V.91
      ii. Energy at the Movies – http://video.klru.tv/video/2240620540 (Michael Webber, UT Austin,
          http://www.me.utexas.edu/directory/faculty/webber/michael/)
   b. Television
      i. Meltdown at Three Mile Island (documentary)
         http://www.youtube.com/watch?v=4vNDIVDvQes
   c. Literature
   d. Photography
      i. Peter Goin and C. Elizabeth Raymond Changing Mines in America
   e. Poetry
ii. Poetry Foundation web site
   1. http://www.poetryfoundation.org/search/?q=coal
   2. http://www.poetryfoundation.org/search/?q=oil


h. Frank Kaminski. The post-oil novel: a celebration! *Published May 11 2008 by Seattle Peak Oil Awareness (SPOA)*. *Published May 11 2008*


j. Ian McEwan, Solar (2010). Nan A. Talese, publisher (A climate and energy novel.)
Module 11.1 – ENERGY SUSTAINABILITY: MYTH OR FANTASY?

1. Learning Outcomes: After completing this unit, you should be able to:
   a. Explain — the principal approaches to energy sustainability
   b. Describe — the measures we must take as individuals toward sustainability

2. Readings
   b. Part II – “Social Futures” in Societies Beyond Oil.

3. In Class
   a. Introduction – The turning point is upon us
   b. Mini-lecture 1 – What is the past
   c. Group Activity – Working in small groups, identify the most practicable measures we can take toward energy sustainability
   d. Mini-lecture 2 – Plan A vs. Plan B: which future will we choose?

4. Homework
   a. Identify the most influential contributors to the solution of the coming problems associated with energy sustainability