ENR 1101 – Thinking Like a Mountain: environmental problems, interdisciplinary solutions

Semester: Fall 2015

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Web Site: WyoCourse site

Description:
What is the nature of environmental problems? Pioneering environmental thinker Aldo Leopold proposed that we “think like a mountain” in order to understand our interconnected world. In this course, you will gain the interdisciplinary skills needed to solve complex problems, using an approach that considers multiple perspectives: scientific, economic, ethical, cultural, and legal/political. From water scarcity in the West to energy development, wildlife impacts, climate change, and global population growth, you will be challenged to think holistically, critically, and across disciplinary boundaries in order to understand and create solutions to our world’s most pressing and complex environmental and natural resource (ENR) challenges.

University Studies Program (USP)
This course fulfills the First-Year Seminar (FYS) requirement of the 2015 University Studies Program. Students will critically examine and evaluate evidence, claims, beliefs, or points of view about meaningful, relevant issues. Students will be introduced to active learning, inquiry of pressing issues, and individual and collaborative processing of ideas through the First-Year Seminar curriculum.

USP Learning Outcomes:
1. Access diverse information through focused research, active discussion, and collaboration with peers.
2. Separate facts from inferences and relevant from irrelevant information, and explain the limitations of information.
3. Evaluate the credibility, accuracy, and reliability of conclusions drawn from information.
4. Recognize and synthesize multiple perspectives to develop innovative viewpoints.
5. Analyze one’s own and others’ assumptions and evaluate the relevance of contexts when presenting a position.
6. Communicate ideas in writing using appropriate documentation.

Additional Course Outcomes:
Identify and explore pressing ENR challenges and solutions from local to global scales.

Develop an appreciation for the interdisciplinary nature of ENR problems.

Gain critical thinking and interdisciplinary problem-solving skills through dissection of complex ENR problems into their root causes, consequences, and solutions.

Identify and critique the effectiveness of relevant environmental policies and regulations.
Grading Breakdown

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Theme Assignments (20, at 10 points each)</td>
<td>200</td>
</tr>
<tr>
<td>Theme Portfolios (2, at 250 points each)</td>
<td>500</td>
</tr>
<tr>
<td>Issue Analysis Paper</td>
<td>300</td>
</tr>
<tr>
<td>Team Policy Proposal</td>
<td>200</td>
</tr>
<tr>
<td>Final Assessment</td>
<td>200</td>
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<tr>
<td>Attendance and Participation</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total available points:</strong></td>
<td><strong>1500</strong></td>
</tr>
</tbody>
</table>

Grading will be on a straight scale:
A = 90–100%, B = 80–89%, C = 70–79%, D = 60–69%, F = < 60%.

Major Assignment Descriptions

**Theme Portfolios**
Choose 2 of the course themes for which you will submit a response portfolio.
Each portfolio can earn up to 250 points, and must include 4 components:
- 1 popular media article (with annotation)
- 1 academic article (with summary)
- 1 short homework or in-class assignment addressing the theme (with reflection)
- 1 theme response: choice of mini-research paper, blog post, abstract, concept map, or video

**Issue Analysis Paper**
Each student will choose a different issue at the local or regional scale to explore the interdisciplinary nature of an ENR-related problem. Each issue analysis paper will begin with a clear identification of the issue and a list/description of multiple stakeholder groups (along with their interests, positions, and desired outcomes). The paper will also explore the economic, scientific, ethical, socio-cultural, and legal-political components of the problem. This is an analytical paper based on several credible, referenced, academic sources (e.g., peer-reviewed journal articles, textbooks, law reviews, etc.). Students will be required to submit a paper outline for peer review, as well as a conceptual map.

**Team Policy Proposal**
Team assignment. Teams of 2-3 students will draft a policy proposal to address a national or international ENR issue. The proposal should be persuasive and well researched. It should be a novel environmental policy or alternative to an existing policy. Each team will create a digital or hard-copy pamphlet to communicate their proposal, and each team will present its policy proposal to the class, specifically addressing the interdisciplinary implications and the likely effectiveness of their proposed policy.

**Final Assessment**
Each student will complete a take-home final assessment, in which they will respond to 5 separate prompts.
Attendance, Late Assignments, and Rewrites
To excel in this course, you must attend class, participate fully, and turn in your assignments on time. Excused absences are determined by the UniReg 6-713. Late assignments will be penalized by 20% for each day the assignment is late. Rewrites are accepted and encouraged for all major assignments; rewrite due dates will be on a case-by-case basis.

Writing Guidelines
All assignments will be evaluated on content as well as writing mechanics (grammar, punctuation, spelling, etc.) and style (clarity, flow, appropriate tone, etc.). Assignment-specific formatting guidelines will be provided.

Student Support
If you have a physical, learning, and/or psychological need that will affect your participation or require accommodations, please let me know as soon as possible. You may choose to register with, and provide documentation of your disability to, University Disability Support Services (UDSS) in SEO, room 109 Knight Hall, 766-6189, TTY: 766-3073, udss@uwyo.edu.

If a need arises for you to drop or withdraw from this course, you must first obtain written permission from the instructor and an academic advisor.

Academic Dishonesty
UniReg 802 strictly forbids academic dishonesty of any type, including plagiarism, copying, and cheating on quizzes or exams. All work you submit is expected to be your own. All sources used in assignments and projects—including those paraphrased and located online—need to be correctly cited. If you use 5 or more words from a source exactly as they are used in that source, you need to put those words in quotation marks and cite the source. Students involved in any form of academic dishonesty may fail the course. If you are unsure of what constitutes an act of academic dishonesty, or would like clarification on this vital issue, please consult your instructor: ask good questions early and often!
Unit Descriptions

Semester-long assignment: AA. Theme Portfolios – see “major assignments” section (2) for more information

UNIT 1: Thinking Like a Mountain
August 31-September 11

This unit introduces the concept of interdisciplinary, interconnected, and holistic problem-solving: in other words, how and why we “think like a mountain” to better understand complex environmental (ENR) problems. Students will be introduced to the nature of ENR issues historically and contemporarily, and will begin working with the 5-perspective approach employed throughout the course: investigating and evaluating the scientific, ethical, cultural, economic, and political/legal components of each problem. Students will also be introduced to the basics of discerning facts, theories, and opinions, and asked to acquire and employ the skills and techniques of critical consumers of information.

Unit overview: a detailed, class-by-class schedule will be provided at the start of each unit.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Readings/Texts</th>
<th>Selected Activities</th>
<th>Selected Assignments</th>
<th>USP Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>Leopold, A. “Thinking Like a Mountain” from Sand County Almanac.</td>
<td>Think/Pair/Share 1-minute brainstorm</td>
<td>Path Map</td>
<td>1</td>
</tr>
<tr>
<td>HOW TO THINK LIKE A MOUNTAIN</td>
<td>Film: Green Fire</td>
<td>Path map sharing</td>
<td>Green Fire</td>
<td>5</td>
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<tr>
<td></td>
<td></td>
<td>Post-it conversation</td>
<td>reflection: What is your relationship to environment?</td>
<td>5</td>
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<tr>
<td></td>
<td></td>
<td>Lecture: introducing interdisciplinary methodology</td>
<td></td>
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</tr>
<tr>
<td>APPROACHES TO INTERDISCIPLINARY THINKING &amp; ENR PROBLEMS</td>
<td>Morton. (2012). The Ecological Thought.</td>
<td>5-perspective “musical chairs”</td>
<td>Chart: 5-perspective breakdown of Merton</td>
<td>5</td>
</tr>
</tbody>
</table>
UNIT 2: Thinking Like the Air  
September 14 - October 9

This unit examines the following questions:
- Where does our energy come from?
- What are the benefits and challenges of renewable and non-renewable energy sources?
- How can we critically evaluate wind energy projects in Wyoming?
- What are the benefits and drawbacks to current and emerging policies around energy development, greenhouse gases, and air quality?

In this unit, students will first explore the benefits, drawbacks, trade-offs, and impacts inherent with all types of energy development. Then, students will examine the current and proposed national policies related to greenhouse gas emissions and air quality.

Students will be asked to critically read and evaluate academic journal articles, news articles, and policy documents, and they will critically evaluate a proposal for a new wind energy development.

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<tbody>
<tr>
<td>ENERGy Basics</td>
<td>EIA Energy Basics</td>
<td>KWLO Chart Lecture</td>
<td>C. Energy Cinquains EIA Energy Quizzes</td>
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<td></td>
<td>The Atlantic Energy 101 videos</td>
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<td></td>
<td>The Rational Middle energy videos</td>
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<tr>
<td>RENEWABLES - Wind in Wyoming</td>
<td>Executive Summary and ROD for Sierra Madre/Chokecherry Wind development</td>
<td>D. Industrial Siting Council Role Play Field trip (wind farm)</td>
<td>ROD abstract D. Industrial Siting Council Role Play Benefits/drawbacks list for wind energy</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>AIR QUALITY POLICIES</td>
<td>EPA Written and Video Summaries of GHG Regulation Proposals</td>
<td>“Silent” Conversation</td>
<td>F. Energy Policy Recommendations</td>
<td>1, 4, 6</td>
</tr>
</tbody>
</table>
UNIT 3: Thinking Like the Water  
October 12-30

This unit explores the complexities of water scarcity, quality, and management, with a focus on the American West. Our driving questions for this unit are:

- Where does our water come from?
- What are the scientific, ethical, political/legal, cultural, and economic components involved in understanding a single major watershed: the Colorado River?
- How might we choose paths to proceed on in the face of uncertainty?

During this unit, students will undertake an issue analysis paper (individual)—not necessarily pertaining to water—that will research and analyze a current local or regional issue, concluding with creative policy and/or research recommendations to move toward solutions. This unit asks students to delineate between “positions” and “interests” and be able to identify them for stakeholder groups, go deeply into a regional case study and evaluate it from multiple perspectives, and move toward synthesizing solutions that address multiple stakeholders and goals, while recognizing that all solutions have elements of uncertainty and information has tangible limits.

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</tr>
</thead>
<tbody>
<tr>
<td>WATER BASICS</td>
<td>USGS Water Basics</td>
<td>Water Use Pop Quiz</td>
<td>G. Issue Analysis Paper</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>WATER IN THE WEST</td>
<td>Film: Watershed (2013)</td>
<td>Guest Lecture: Dr. Scott Miller</td>
<td>H. Watershed stakeholder chart with analysis</td>
<td>4, 5</td>
</tr>
<tr>
<td>CASE STUDY: COLORADO RIVER</td>
<td>NYT: Colorado River Drought</td>
<td>I. 60-60-30-30</td>
<td>“Law of the River” concept map</td>
<td>1, 2</td>
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<td></td>
<td>Bureau of Reclamation: “Law of the River”</td>
<td>Colorado River ethics</td>
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</table>
UNIT 4: Thinking Like Wildlife
November 3-20

In this unit, we will explore the basic concepts of biological diversity, including species diversity, species loss, and how biological diversity is intertwined human wellbeing. Using case studies from local and species-specific (the Grey Wolf and Greater Sage Grouse) to global (the United Nations Convention on Biological Diversity), we will dive into the ecological, social, and economic connections that emerge when we tug on just one string of the biological web.

Students will analyze and evaluate U.S. national policies such as the Endangered Species Act as measures to address species loss and the values we place on biological diversity, specifically wildlife. Students will also begin to investigate and critique global environmental policies meant to address international and trans-boundary issues such as biodiversity, and evaluate how science, culture, economics, ethics, and politics intertwine when making global policy decisions.

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</tr>
</thead>
<tbody>
<tr>
<td>BIOLOGICAL DIVERSITY</td>
<td>Wilson (2002)</td>
<td>Guest Lecture</td>
<td>Reinterpretation of the CBD</td>
<td>1</td>
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<td></td>
<td>Lin (2012) <em>What is Missing?</em></td>
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<td></td>
<td>Official Preamble: Convention on Biological Diversity (1992)</td>
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<tr>
<td>ENDANGERED SPECIES ACT</td>
<td>Pulliam &amp; Babbitt (1992)</td>
<td>ESA flow chart activity</td>
<td>J. USFWS Role Play</td>
<td>1, 3, 4, 5</td>
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<tr>
<td></td>
<td>USFWS Grey Wolf Species Recovery Plan</td>
<td>habitat, food, climate, culture</td>
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<td></td>
<td>Thuermer (2014)</td>
<td>Problem-solving outside the ESA</td>
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<td></td>
<td>LeBeau, et. al (2014)</td>
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Climate Change & Global Population

As we move toward the most pressing global issues of our time, this unit asks us to synthesize all the elements of interdisciplinary problems and propose creative solutions that address multiple perspectives and needs. Focusing on climate change and global human population growth, students will continue to “think like a mountain” in order to approach a wide range of complex challenges with creativity integration.

Students will understand the basics of climate science as well as engage with the concept of scientific consensus. Investigating current and proposed national and international policy solutions to climate change, students will evaluate, synthesize, and create complex solutions that address adaptation, mitigation, and other strategies for addressing climate change. Students will also be able to recognize and articulate multiple components influencing global population growth and the interdisciplinary approaches required to address it.

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</thead>
<tbody>
<tr>
<td>CLIMATE CHANGE SCIENCE</td>
<td>IPCC (2013) Summary for Policymakers</td>
<td>Guest Lecture</td>
<td>M. Letter to Grandma Jean</td>
<td>3, 5, 6</td>
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<td>NASA Climate Science Quizzes</td>
<td></td>
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<tr>
<td>CLIMATE POLICY (NATIONAL &amp; INTERNATIONAL)</td>
<td>EPA (2014) Proposed GHG Policy</td>
<td>Solutions debate</td>
<td>Climate collage: science, policy, ethics, culture, economics</td>
<td>1, 3</td>
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<td></td>
<td>NPR Planet Money (2014)</td>
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<td>The Economist Climate Reader</td>
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<td></td>
<td>IPCC Overview</td>
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<tr>
<td>GLOBAL SOLUTIONS</td>
<td></td>
<td>Team policy proposal presentations</td>
<td>O. Team Policy Proposal</td>
<td>1, 2, 3, 4, 5, 6</td>
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Selected Assessment Tools & Rubrics – ENR 1101 FYS

Issue Analysis Paper Rubric

**USP LEARNING OUTCOME**
6. Communicate ideas in writing, using appropriate documentation.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Structure/Development (300 points)</th>
<th>Support/Evidence (150 points)</th>
<th>Style (50 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Ideas and points clearly stated; appropriate sense of complexity of the topic; thoughtful consideration of the interdisciplinary aspects of the problem; proper identification of stakeholders and their issues/positions; logical structure of ideas.</td>
<td>Convincing, thorough support; uses range of evidence (direct quote, paraphrase, summary, secondary sources); evidence is contextualized (introduced and thoroughly explained); uses consistent citation style.</td>
<td>Clean and confident; well-established tone throughout; almost completely free of syntactical/grammatical errors.</td>
</tr>
<tr>
<td>Good</td>
<td>Ideas and points mostly clear; may not fully explain/develop each interdisciplinary element of the problem; proper identification of stakeholders but not full development of their issues/positions; logic of development is adequate, though not sophisticated.</td>
<td>Adequate support for assertions; uses two or three kinds of evidence (from direct quote, paraphrase, summary, secondary sources); evidence, in most cases, is contextualized; uses citations, with few mistakes.</td>
<td>Minimal presentation errors; generally easy to read with consistent tone throughout.</td>
</tr>
<tr>
<td>Fair</td>
<td>Ideas and points noticeably underdeveloped; interdisciplinary explanations “thin”; poor representation of stakeholders and/or their positions; logical gaps in the development.</td>
<td>Under-supported claims; may fail to deploy a range of evidence; writer may misunderstand or not fully contextualize evidence using the text; missed citations or used incorrect formatting.</td>
<td>Can have presentation errors that confuse meaning; style and tone may feel inconsistent or tentative.</td>
</tr>
<tr>
<td>Inadequate</td>
<td>Writer may significantly misunderstand the issue; stakeholders not identified or their positions/interests are off-base; development is illogical and/or difficult to follow.</td>
<td>Little or no evidence in support of claims; citations and style of citations may be inconsistent.</td>
<td>Distracting level of error.</td>
</tr>
<tr>
<td>Failed</td>
<td>Little or no development of the writer’s idea; little or no discussion of the interdisciplinary aspects of the problem; failure to identify stakeholders and their positions.</td>
<td>Writer frequently or always fails to cite sources.</td>
<td>Egregious level of error.</td>
</tr>
</tbody>
</table>
Theme Response Portfolio - Checklist Rubric

USP LEARNING OUTCOMES
1. Access diverse information through focused research, active discussion, & peer evaluation.
3. Evaluate the credibility, accuracy, and reliability of conclusions drawn from information.
5. Analyze one's own and others' assumptions and evaluate the relevance of contexts when presenting a position.

Popular Media Article with Annotation (50)
☐ Appropriate selection of article
☐ Fair and thorough annotation (>5 notes per page)

Academic Article with Summary/Abstract (50)
☐ Appropriate selection of article
☐ Strong comprehension, reasonable conclusions, and thorough, succinct summarization

Theme Assignment with Reflection (50)
☐ Appropriate selection of an assignment from a previous theme
☐ Sincere, thoughtful reflection and insight into previous performance and subsequent growth

Component 4 (100)
☐ Selected format in consultation with instructor
☐ Follows planned format in substantive and consistent way
☐ Investigates a novel element or topic within the theme, evaluates multiple contexts for topic

Global Population Response Paper – Narrative Rubric/Grading Criteria

USP LEARNING OUTCOMES
4. Recognize and synthesize multiple perspectives to develop innovative viewpoints.
5. Analyze one's own and others' assumptions and evaluate the relevance of contexts when presenting a position.
6. Communicate ideas in writing, using appropriate documentation.

_____ /10 Clear, concise thesis statement

_____ /10 Use of multiple perspective analysis in response

_____ /10 Thoughtful citation(s) of Wilson/Simon readings; proper integration of quotations in text

_____ /10 Recognition and analysis of competing and intersecting assumptions and needs

_____ /10 Appropriate employment of accurate and credible sources
Team Policy Proposal – Narrative Grading Sheet

USP LEARNING OUTCOMES
1. Access diverse information through focused research, active discussion, and collaboration with peers.
2. Separate facts from inferences and relevant from irrelevant information, and explain the limitations of information.
3. Evaluate the credibility, accuracy, and reliability of conclusions drawn from information.
4. Recognize and synthesize multiple perspectives to develop innovative viewpoints.
5. Analyze one’s own and others’ assumptions and evaluate the relevance of contexts when presenting a position.
6. Communicate ideas in writing using appropriate documentation.

Group: 
Topic: 

1) Content coverage: Thorough coverage of national/international issue that synthesizes existing policies, cultural perspectives, and scientific research; persuasive, well-researched, novel policy proposal that employs an innovative approach to addressing the issue and considers nuanced, interdisciplinary impacts and benefits. (100 points)

2) Presentation Style (20 points)
   a) Participation
   b) Timing
   c) Decorum

3) Visual Communication Strategies: Choice of visuals in presentation aid in the engagement and understanding of the audience and enhance the content with relevant contextual information. (20 points)

4) Digital Handout/Pamphlet: Communicates policy proposal and informs the audience of the issue in a clear, concise, and creative way. (40 points)

5) Collaboration: Evidence of collaborative work/team cohesion and individual participation in the research, conception, and proposal-writing stages of the project. (20 points)
AA. Theme Portfolios represent growth and depth of learning; synthesize unit content/skills

USP Learning Outcomes: 1-6, depending on choice of component 4.

Assessment: Checklist Rubric

Choose 2 of the course themes (see below) for which you will submit a portfolio. Each response can earn up to 250 points, and must include 4 components:

- 1 popular media article (with annotation)
- 1 academic article (with summary)
- 1 short homework or in-class assignment addressing the theme (with reflection)
- 1 mini-research paper, letter, abstract, or concept map
  - specific topic and format determined in consultation with instructor

Theme Choices: WATER, WILDLIFE/BIODIVERSITY, ENERGY, CLIMATE CHANGE, GLOBAL POPULATION

Component 1: Popular Media Article (annotated)
- Choose a popular media article reporting on news related to your theme’s topic
- Article should be from a reputable print or online media source. See News Sources for ENR handout for ideas.
- Highlight, underline, and write questions/comments in the margins of a popular media article reporting on the topic. Note when interdisciplinary elements (e.g. science, economics, ethics, policy, culture) are discussed. Identify facts, theories, and opinions.
- Informal – can be handwritten; turn in marked up article.

Component 2: Academic Article (with summary)
- Choose a peer-reviewed, academic article addressing at least 2 of the political/legal, scientific, economic, ethical, and/or cultural components of the theme/topic.
- Provide a very short summary (<250 words) of the article
- After the summary, explain how the course’s themes appear in the article (<250 words)
- Formal – must submit the original article along with a typed summary and explanation.

Component 3: Theme Assignment (with reflection)
- Choose one of the assignments or in-class exercises from the theme’s class sessions.
- Write or make a video with a brief reflection on your work. The reflection should include
  - a critique (something you would do differently next time),
  - a point of success (something you did well), and
  - 2-3 “takeaway” points learned about the topic through the activity/assignment.

Component 4: Choice - Mini Research Paper, Blog Entry, Abstract, or Concept Map
- Choose one format.
- Specific topic and format determined in consultation with the instructor; options include
A. "Speed Dating" – facts, theories, opinions

USP Learning Outcomes Met: 1, 2
Materials needed: printed NYT op-ed pieces, highlighters/markers/colored pens
Time: 50 minutes
Assessment: reviewing marked papers, gauging discussion comprehension, follow-up theme assignment (FTO annotation).

- Choose two relevant (theme, topic, current event) op-eds (New York Times)
- Hand out NYT opinion pieces – half get 1 title, half get the other
- Each individual marks the piece with highlighters/colored pens
  ○ Green – Fact
  ○ Yellow – Theory
  ○ Red – Opinion
- Share in pairs (same title) via “speed dating”
  ○ Identify statements you agreed upon
  ○ Identify statements upon which you disagreed
  ○ Identify statements upon which you are unsure
  ○ Share chart on white board
- If time: trade with students who marked the other piece
B. Discussion: Unpacking Interdisciplinary Components

**USP Learning Outcomes Met:** 1, 5

**Materials needed:** in-class and out-of-class reading, whiteboard

**Time:** 30-45 minutes

**Assessment:** discussion efficacy, appearance of 5 themes in subsequent assignments and reflection papers

Using Morton’s (2012) *The Ecological Thought*, in small groups (3-4), list the big categories of “ways of knowing” and understanding ENR issues Morton references.

- Science
- Economics
- Culture
- Law/Policy
- Ethics

Now, consider the issue of the Moose-Wilson Road Corridor that we investigated during our field week in Jackson. In your small groups, discuss how the Moose-Wilson Road issue broke into these categories and also crossed the boundaries between them.

- Why might this “boundary-crossing” emerge?
- How do we think about “interdisciplinary” challenges, and how are they different from/similar to disciplinary ones?
- How does breaking them into categories help us understand them, and see them more holistically?

C. Energy Cinquains

**USP Learning Outcomes Met:** 5 (particularly when shared)

**Time:** 1 day for assignment

**Assessment:** Discussion – assess prior knowledge/perceptions through informal writing

You will write 2 cinquains, one about renewable energy and one about fossil fuels/non-renewable energy. A cinquain is a 5-line poem that follows a specific structure:

**Line 1** - 1 word that names the concept, object or idea

**Line 2** - 2 words that describe the concept, object or idea in Line 1

**Line 3** - 3 words that tell about the function or purpose of Line 1

**Line 4** - 4 words that sum up how you feel about Line 1

**Line 5** - 1 word that is a synonym for Line 1

**Water**
Ubiquitous. Scarce.
For fighting over.
Have never been without.
Conflict.
D. Role Play: Industrial Siting Council

**USP Learning Outcomes Met:** 1, 2, 3, 4, 5, 6

**Time:** 7 days for completion out of class; 1 full class period for reporting back

**Assessment:** Rubric

You are on the State of Wyoming Industrial Siting Council and you are preparing for the upcoming hearing wherein Power Company of Wyoming LLC will defend its permit application to develop and operate the Chokecherry-Sierra Madre wind development southeast of Sinclair, Wyoming. Each member of the council has an area of expertise: wildlife, economics, cultural resources, and law.

Working in groups of 4, decide which area of expertise you will represent on the council. All 4 specialties must be represented.

After reading the Executive Summary of the permit application as well as the Record of Decision (ROD) given by the BLM, write a brief (no more than 2-page) preliminary ruling on whether you will approve the project. If you'd like additional information, you can view the whole permit application online here.

You can either 1) approve the project; 2) deny the project; or 3) conditionally approve the project provided the developers follow up on certain stipulations that you outline in your response.

All 4 areas of expertise (wildlife, economics, cultural resources, and law) must be included as part of your ruling, and you must describe which areas received priority, and why. Justify your position based on class readings, lecture, discussions, and outside research. Accordingly, you should provide a "References" list at the end of the document, which does not count toward your page limit.

Second, prepare three questions to ask the Power Company of Wyoming LLC project developers at the hearing, based on your knowledge of wind energy issues and class readings/discussion. These questions should be what you would like to know more about before you will accept or reject the permit application. The scope of your questions can be broad, but do not ask a question that can be answered from information contained in the Executive Summary.
E. Each one teach one (graphs)

*USP Learning Outcomes Met: 2*
*Materials needed:* printed EIA graphs, slides with EIA graphs
*Time:* With 20 students: 50 minutes
*Assessment:* In-class observation

Pick 2 of the graphs laid out around the room (collected from the Energy Information Administration) that you find interesting. You can choose graphs that work together as a set (interrelated) or that stand alone as individual graphs.

After reading and getting a handle on your graphs/figures, you will give the class “fast-forward” explanation (1-2 minutes) of the information presented in the graph.

F. Energy Policy Recommendations

*USP Learning Outcomes Met: 1, 4, 6*
*Assessment:* Rubric

Choose three of the following potential policies you would choose to implement in an effort to manage the energy challenges here in the U.S. You will need to do some basic research into many of the options listed below before you make your choice.

In a brief report, describe: 1) why you chose each policy, 2) what problems each policy might solve, and 3) what drawbacks each presents.

- Incentives (subsidies, tax breaks) for fossil fuel industries
- Incentives (subsidies, tax breaks) for renewable industries
- Carbon tax (on industry)
- Cap & trade system (on industry)
- Carbon emission ppm limit
- International agreement (similar to the Kyoto Protocol or Copenhagen Accord)
- Higher taxes on consumers of fossil fuels (oil & gas tax increase)
- Other policy (you describe)
G. Issue Analysis Paper

USP Learning Outcomes Met: 1, 2, 3, 4, 5, 6.
Time: With draft and peer editing, 4-5 weeks
Assessment: Rubric

Research Topic due: September 28
Research Outline (for peer editing) due: October 12
Paper due: October 30

Each student will choose a topic at the local or regional scale to explore the interdisciplinary nature of ENR problems. The paper should be clear and concise, and reflect the diversity of positions and interested parties who may be involved in a given issue. In this paper you will introduce the topic, provide some history and background, and then explore the economic, scientific, ethical, cultural, and political components of the problem. You will conclude with a policy analysis, outlining the current solutions and their benefits and drawbacks. A more detailed formatting guide will be provided.

H. Watershed Stakeholder Analysis

USP Learning Outcomes Met: 4, 5.
Time: Assigned, with 30-minute in-class discussion
Assessment: Checklist Rubric

As you watch the film Watershed, take notes, which you will submit in class.

- Identify the stakeholders, along with their positions and interests
- Identify scientific, cultural, ethical, legal, and economic issues addressed in the film
- Identify the policy solution you would recommend, and why.
- Identify the perspectives and stakeholders missing from or minimized in the film.

Then, write a 1-page analysis (not a reflection) unpacking the reasons given for each stakeholder position in the film. What information is left out? What types of information support stakeholder positions?
I. 60-60-30-30 Colorado River Ethics

**USP Learning Outcomes Met:** 1, 4  
**Materials needed:** NYT story  
**Time:** 15 minutes to read in-class; 15 minutes for activity  
**Assessment:** Reflection, depth of dialogue, comprehension for in-class application

Read New York Times – *Colorado River drought*  
Partner 1 gets 60 seconds, uninterrupted, to respond to the question  
Partner 2 gets 60 seconds, uninterrupted, to respond to her/his partner’s statement  
Partner 1 gets 30 seconds to answer  
Partner 2 gets 30 seconds to answer

Questions/Prompts:  
1. What are the ethical challenges of water management on the Colorado River?  
2. Which factors—science, culture/values, economics, ethics, or politics—do you think should influence water management more?  
3. What kinds of policies would you propose to promote conservation, and on whom/which sectors of use would you apply it?

J. Role Play: USFWS Panel – making decisions

**USP Learning Outcomes Met:** 1, 3, 4, 5  
**Time:** 1 class period for prep, 1 for presenting decisions  
**Assessment:** In-class observation, checklist-style rubric for rationale document

Using the WyoFile report *Mead wants feds to reverse sage grouse status* (17 June 2014) as the launch point for continued research, you will sit on a US Fish and Wildlife Service panel to inform their upcoming decision. As a panel, you will explain the reasons to choose or reject each of these options regarding the ESA status of the sage grouse.  
1) Keep the sage grouse as a “warranted but precluded” candidate species  
2) Change the sage grouse’s ESA status to “not warranted”  
3) List the sage grouse as an endangered species

In your decision, you must provide rationale for choosing or rejecting that option. That rationale must include

- ≥ 3 different sources  
- information that includes each of the 5 perspectives on ENR issues (science, culture, economics, ethics, law/politics)  
- acknowledgment of the drawbacks and negative consequences of your chosen option
K. Grey Wolf Stakeholder Mapping

USP Learning Outcomes Met: 2, 3, 5
Assessment: Rubric

Read/listen to the following three reports from National Public Radio on the Grey Wolf in the Rocky Mountain region:

Wolves at the Door
Grey Wolves Lose Endangered Status...for good?
Grey Wolves in the Crosshairs Again After Delisting

Make a chart of stakeholder groups, and identify each group’s position on the wolf reintroduction in the Greater Yellowstone Ecosystem (what they would like to see happen), as well as that group’s interests (why they have that position, and what values and interests are driving their stance), and at least one fact they invoke in support of their position. Your chart could look like a concept map, table, or diagram. Example:

<table>
<thead>
<tr>
<th>Stakeholder Group</th>
<th>Position on Wolves in the GYE</th>
<th>Interests, Values, &amp; Drivers</th>
<th>Fact (with citation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranchers in Bitterroot Valley</td>
<td>Split; most happy to see them delisted, many were against reintroduction. Want hunting rights and predator status.</td>
<td>Feel their livestock and economic livelihood threatened; long history and culture of ranching and wolf conflict/eradication.</td>
<td>1/3 of Montana’s employed workers are in the agricultural sector (US Bureau of Economic Analysis: Regional Accounts, 2005).</td>
</tr>
</tbody>
</table>

L. Endangered Species Report identify multiple sources, policy plans, and value systems

USP Learning Outcomes Met: 1, 6
Assessment: Checklist rubric

Research one endangered species (plant or animal) listed by the U.S. Fish and Wildlife Service and create a profile of that species. Format: formal – must be typed, in complete sentences, and go into some level of detail; in-text citations and reference list required. Also include a visual image of your species. In your report, explain:

- What it is (its general characteristics);
- Why it’s endangered (what is threatening it? – be specific here: if it’s fragmentation, what’s causing the fragmentation?);
- What is being done to protect the species (some of the main components of its recovery plan);
- Why you think it is important to protect this species or why you think protections should be lifted.

NOTE: You must include a minimum of 3 sources (with proper citation), 1 of which must be an academic source, and 1 of which must be the US Fish & Wildlife Service official Species Recovery Plan for your chosen species: See example for Northern Rockies Grey Wolf
**M. Letter to Grandma Jean** explain content knowledge; utilize appropriate style and context

**USP Learning Outcomes:** 3, 5, 6  
**Assessment:** Rubric

A good friend’s grandma (Grandma Jean) has been following recent political coverage and has started reading a little bit about carbon legislation and climate change. She knows you’re enrolled in an Environment and Natural Resources course at UW, and therefore you’re the most knowledgeable person on climate change policy that she knows. She wrote you a letter asking you about climate change, and you’ve been putting it off, but it’s time to respond.

Write Grandma Jean a response that answers the questions that she posed to you in her letter, and add any additional information as you see fit. The questions are:

1) Is climate change real? Can you tell me about the science behind it?

2) What is the difference between a carbon tax and a cap and trade policy for carbon?

3) Which policy do you think is a better idea? Why?

4) What is the EPA really proposing as a new policy for limiting CO2 emissions?

5) Why do we need these policies all of a sudden if we haven’t had them yet in my 80-year lifetime?

Use an appropriate tone for a friendly letter to a woman who is elderly and whom you don’t really know. Letters should be no less than one page, and no more than three pages long.

**N. Global Population Response** formal writing, synthesis of ideas, assumption analysis

**USP Learning Outcomes:** 4, 5, 6  
**Assessment:** Narrative Rubric

Write a 2-page response paper, framed around a thesis statement and using at least 2 sources (with citation), to the following prompt:

“Pressures resulting from unrestrained population growth put demands on the natural world that can overwhelm any efforts to achieve a sustainable future. If we are to halt the destruction of our environment, we must accept limits to that growth.” - World Scientists’ Warning to Humanity, signed by 1600 senior scientists from 70 countries, including 102 Nobel Prize laureates

Do you agree with this statement? The format for this reading reaction assignment is flexible, but some questions you may want to consider are: a) what the impacts of population growth are; b) what a “sustainable future” means; c) if you agree with the statement, what “accepting limits to growth” entails; or d) if you don’t agree with the statement, consider if there are ways to lessen impacts on the environment as the population grows.
O. Team Policy Proposal

USP Learning Outcomes: 1-6
Assessment: Narrative Grading Sheet

Team assignment. Teams of 2-3 students will draft a policy proposal to address a national or international ENR issue. The proposal should be persuasive and well researched. It should be a novel environmental policy or alternative to an existing policy. Each team will then present its policy proposal to the class and should be prepared to answer questions on the interdisciplinary implications and the likely effectiveness of their proposed policy.

For Reference

USP 2015 FYS Learning Outcomes
1. Access diverse information through focused research, active discussion, and collaboration with peers.
2. Separate facts from inferences and relevant from irrelevant information, and explain the limitations of information.
3. Evaluate the credibility, accuracy, and reliability of conclusions drawn from information.
4. Recognize and synthesize multiple perspectives to develop innovative viewpoints.
5. Analyze one's own and others' assumptions and evaluate the relevance of contexts when presenting a position.
6. Communicate ideas in writing using appropriate documentation.
In the following table, please provide a brief description (50 words or less) and attach appropriate documents (if necessary) that demonstrate how each Student Learning Outcome will be achieved in this course and how each outcome will be assessed in this course.

<table>
<thead>
<tr>
<th>FYS Student Learning Outcomes</th>
<th>How will this outcome be achieved[^1] in this course?</th>
<th>How will this outcome be assessed[^2] in this course?</th>
</tr>
</thead>
</table>
| Access diverse information through focused research, active discussion, and collaboration with peers. | More thorough descriptions for all assignments, projects, and activities with highlighted letter codes are in the syllabus and attached “Assignment and Activity Descriptions” document.  
AA. Theme Response Portfolios  
D. Industrial Siting Council: Role Play  
I. 60-60-30-30 Colorado River Ethics Discussion | Detailed examples of rubrics and assessment strategies are attached, as noted.  
Rubric (see attached)  
Rubric evaluating collaborative strategies while making decisions based on complex perspectives and diverse information sources.  
Written and verbal reflection, depth of dialogue and level of engagement in direct student-student interaction; comprehension of active discussion principles for future in-class application. |
| Separate facts from inferences and relevant from irrelevant information, and explain the limitations of information. | A. Fact/Theory/Opinion: Speed Dating activity  
K. Grey Wolf Stakeholder Map | Reviewing marked papers to identify misconceptions, gauging discussion comprehension of FTO differences; follow-up individual assignment (FTO annotation) to evaluate level of individual confidence in practice.  
Rubric assessing relevant application and selection of information from a wide range of sources, and acknowledgment of the limits of sources and perspectives; in-class follow-up discussion asking for differentiation among positions, interests, and support evidence. |
| Evaluate the credibility, accuracy, and reliability of conclusions drawn from information. | E. Each one teach one activity: ELA graph interpretation  
M. Letter to Grandma Jean – explaining climate change | In-class presentations: direct questioning of graph interpretations, evaluating level of accuracy and reliability of interpretations.  
Rubric evaluating choice of sources, accuracy of interpretation and explanation in the letter; consistency of connecting statements to reliable source information. |
<table>
<thead>
<tr>
<th>FYS Student Learning Outcomes</th>
<th>How will this outcome be achieved 1 in this course?</th>
<th>How will this outcome be assessed 2 in this course?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognize and synthesize multiple perspectives to develop innovative viewpoints.</td>
<td>F. Energy Policy Recommendations</td>
<td>Checklist rubric evaluating synthesis strategies and rationale for addressing complex issues with multiple viewpoints on a given policy.</td>
</tr>
<tr>
<td></td>
<td>H. Watershed Stakeholder Analysis</td>
<td>Checklist Rubric assessing depth of representation of multiple perspectives in stakeholder analysis; level of understanding of interdisciplinary problems as complex.</td>
</tr>
<tr>
<td></td>
<td>O. Team Policy Proposal</td>
<td>Performance Assessment (presentation, Q&amp;A) and Rubric (see attached) assessing proposal's innovative and thorough solutions to complex problems.</td>
</tr>
<tr>
<td>Analyze one's own and others' assumptions and evaluate the relevance of contexts when presenting a position.</td>
<td>B. Discussion: Unpacking Interdisciplinary Components</td>
<td>Observation of discussion efficacy, appearance of 5 themes in subsequent assignments and reflection papers</td>
</tr>
<tr>
<td></td>
<td>C. Energy Cinquains</td>
<td>Observation via discussion and written cinquains to assess prior knowledge/perceptions already held by students; cinquains after end of unit will be compared via discussion to see what other information changes context.</td>
</tr>
<tr>
<td></td>
<td>J. Role Play: USFWS Panel – making decisions</td>
<td>In-class observation, checklist-style rubric seeking contextual references and evaluative rationale and identified assumptions of stakeholders.</td>
</tr>
<tr>
<td>Communicate ideas in writing using appropriate documentation.</td>
<td>G. Issue Analysis Paper</td>
<td>Rubric (see attached)</td>
</tr>
<tr>
<td></td>
<td>L. Endangered Species Report</td>
<td>Checklist rubric for appropriate documentation, citation style, and strength of explication.</td>
</tr>
<tr>
<td></td>
<td>N. Global Population Response Paper</td>
<td>Narrative rubric (see attached)</td>
</tr>
</tbody>
</table>

1 *Achievement* of a Student Learning Outcome will involve various educational strategies that may vary by both course and outcome. Some of these strategies will be employed 'in class' (e.g. lectures, student presentations, discussions, laboratory exercises, writing assignments, sample problems, pair-shares), while others will be realized out-of-class (e.g. readings, homework problems, literature searches, writing assignments). In other words, educational strategies include any and all activities employed in a course that help students to achieve the outcome.

2 *Assessment* is one or more processes that identify, collect, and prepare data to evaluate the attainment of student learning outcomes. Effective assessment uses relevant direct, indirect, quantitative, and qualitative measures as appropriate to the outcome being measured. Different assessment methods may be used for different outcomes: appropriate sample methods may also be used. Assessment methods that might be employed include direct assessment of student work, standardized examinations/exam questions, locally developed examinations/exam questions, simulations, exit interviews, written surveys or questionnaires, focus groups, performance appraisals, external examiners, oral exams, behavioral observations, and portfolios.