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EVST 501.01: Scientific Approaches to Environmental Problems

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Scientific Approaches to Environmental Problems

EVST 501

Fall 2008

Facilitator: Len Broberg

107A Rankin Hall

243-5209

Ofc. Hours: Wednesday 12:30-2:30 pm, Thursday 11:30-1:30 pm

Purpose of the Class

The class is designed to introduce students without a science background to the approach, methodology, and concerns of scientists and scientific institutions. Conservation biology will be used as a substantive scientific focus for the class. Students will do a real world project involving the gathering and translation of scientific/technical information for use in environmental decision-making. Ultimately the purpose of the class is to equip students with enough familiarity with science to interpret basic scientific materials, gather scientific information and effectively incorporate scientific information in an environmental decision-making process.

Required Texts:

ERES: <http://eres.lib.umt.edu> then search under Broberg as instructor and use password "junk"

Tentative Schedule- Read the ERES material for the date except where otherwise indicated on the syllabus

- | | | |
|-------|------|--|
| Aug. | 26 | Intro |
| | Aug. | 28 Science database research- Barry Brown, Science Librarian- meet at the Mansfield Library |
| Sept. | 2 | Science and worldviews |
| | 4 | The hypothetico-deductive method |
| | 9 | Statistics- type I & II error |
| | 11 | Risk Assessment |
| | 15 | Drop/add with refund |
| | 16 | Alternatives assessment |
| | 18 | Precautionary Principle |
| | 23 | Public Land Law Conference- 10:15am-12 noon UC Center 3rd Floor : The Whole Landscape-Managing Beyond Traditional Boundaries |
| | 25 | Response to Svensmark et al Select Project |
| | 30 | Biodiversity -- First Project Report due & action plan due |

- Oct 2 Biodiversity continued
- Oct. 6 Makeup for Oct 16th- 2-3 pm place TBA
 Dan Kemmis, Center for the Rocky Mountain West- science's role in natural resource decisions Read: Kemmis
Drop/add deadline
- 7 Values in science
- 9 Scientists as advocates- barriers & benefits
- 14 Dane Scott- Center for Ethics- "Sound Science"
- 16 No class
- 21 Conservation biology and activists **Action plan/journal due**
- 23 Science and policymaking

Oct 28-Nov 13 Project presentations

- Nov 6 Second Project Report Due**
- 18 Science and policymaking (continued)
- 20 Science in the courtroom
- 23 Thanksgiving Holiday- No class

Nov. 25-Dec.4 & Final exam date-Wednesday, December 10, 10:10 am -12:10 - Final presentations

Dec. 4 Final Project Report Due

Projects

Students will work individually on a project for an organization. A list of potential projects will be distributed in class and posted on my door. In addition, a folder containing information relevant to the projects will be placed in the EVST reading room, JRH M-3, for your review at your convenience. You will be required to select a project by **September 23rd**. I am happy to discuss projects with students before selection. Oftentimes more than one student wants to sign up for a project (or on projects divided between several students- more than the project can support)- I encourage you to seek out your classmates and try and resolve the duplication to your mutual satisfaction. In the event that you cannot decide the issue, the instructor will be the final arbiter.

The projects are designed to be completed in a semester. Some projects, however, may require field work to some degree and others may require the acquisition of some biological skills in the field. These projects are excellent learning experiences, but make sure you allow adequate time in your schedule to handle the travel time and inevitable trial and error in the field so that you do not

overload yourself.

Please do not contact the individual organizations about the project prior to the approval of your selection by the instructor, unless you gain instructor approval first. The groups are more than happy to hear from you, but we do not wish to burden them with multiple calls asking the same questions. Ask me first and we'll take it from there.

There are several steps to the project process. The timetable for these events is as follows:

Select project- September 23

In the first week following selection get in contact with the contact person and schedule a meeting (at least a phone conference) to get together with them and anyone else important to the project.

First Project Report- September 30

This report will do the following: 1) Identify the group with which you are working, 2) outline what the major scientific/technical issues are that you will be addressing, 3) identify why this work is important to the organization and the environment, 4) reveal what your concerns are about completing the project (what are your strong and weak points), 5) initial operational plans for the project and 6) set forth a tentative timeline for the project.

Second Project Report- November 6

You will complete a report summarizing your work to date analyzing the scientific issues involved in your project and the political and social impacts of these issues. This will include an itemization of the major scientific issues involved, the needs of the advocates you are working with and the direction that your research/work seems to be leading. By agreement with the grassroots organization, this interim product can take a different form than the standard report.

Oral presentations to the class will be made on **October 28- November 13**.

Final Report/Product- December 4

This will be the final work product you will produce for your client. You will make a final presentation to the class on **November 25, December 2, 4 or the final exam date 12/10 10:10 am- 12:10pm**.

Action plan/daily journal

In a daily journal format you will record the steps taken to complete your project. The journal will be a personal resource that tracks your work and a planning tool. Following project selection you will turn in an action plan that identifies the steps you will take in the next 3 weeks to complete the project so that the facilitator and/or teaching assistant can make suggestions. On October 21 you will turn in a journal that has your research to date, your ideas on further steps and directions and some preliminary conclusions for instructor review and comment.

Action plan/journal due dates:

September 30- action plan only

Oct. 21- action plan and journal

Other exercises

1. From time to time we will ask you to write your thoughts on issues relevant to the reading for class. These assignments need not be typed but should be legible. In the course of these assignments, if we ask you to take a position or analyze a problem I encourage you to use a format for analysis based on legal writing methodology. This format is called IRAC, an acronym for Issue, Rule, Analysis, and Conclusion. This format can be adapted to this class by starting with a discussion of what the issue is, next list and explain the guiding principles you think apply, follow with your analysis of how these principles apply to the situation under consideration and finish with a summary conclusion. There are other effective ways to communicate ideas and analysis which are equally acceptable, but I urge you to try this out as a way of organizing your thinking at least once in the course of these assignments.
2. There will be one assignment which will require you to use the library or other sources to find scientific support for a response to an article.

Office Hours

The facilitator has set office hours which are available for drop-in consultation. Len is also available at other times by appointment. You may make appointments in class or by telephone.

Grading

The grade in the class will be based largely on the project and associated work (oral presentations, journal/action plan, and written reports/products). Plus/minus grading will be used. The breakdown is as follows:

- Project 70%
- Class participation 20%
- Other assignments 10%

If I do not receive confirmation from your group that they have received your final product by the end of exam week YOU WILL RECEIVE AN INCOMPLETE!

Learning Objectives

By the end of the course students should:

1. Be able to explain and apply the scientific method to environmental problems.
2. Understand and communicate the strengths and limitations of science in resolving those issues.
3. Be able to locate and translate relevant scientific and/or technical material.
4. Be able to locate experts for consultation.
5. Have improved their oral and written communication and presentation skills.