ST OLAF COLLEGE

Create Your Own Environmental Study

A proposed new course for the Environmental Studies Department

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This course proposal was created through my individual senior project for my Environmental Studies senior capstone project at St Olaf College in Northfield, MN. My hope is for this course to be added to the Environmental Studies department to enrich students both within the department as well as in the student body.

ES 291: Environmental Media: Science or Fiction
or Choose Your Environmental Study

Envtl Med.: Sci or Fict? (0.25 cr.)

Students will explore how current topics in environmental science are presented in the media. Through conversation and reading of current research, students will explore four topics together and ground their knowledge in reliable academic sources. This course aims to bring together students of many disciplines to engage in productive discussion. Class content is primarily student-lead. Emphasis on collaborative learning, investigative question-asking, and strengthening research and oral presentation skills. Permission of instructor required. Course may be repeated if different topic.

My Intention Statement

One of the things I value most about a liberal arts education is the opportunity to explore multiple disciplines and gain a variety of perspectives unto the world. Our education at St Olaf is designed to expose us to the world and teach us how to interact with it. David Orr says that "all education is environmental education." While I believe this to be true, the system of having separate and distinct disciplines of study makes it difficult to see the connection at times. My goal with this course is to create a way for students to come together and explore the world.

I have long envied the Biology department for the series of smaller-credit topic courses offered throughout the year, and have often wished that there were a comparable course offering in the Environmental Studies department. This fall I was inspired by a quarter-credit Biology course taught by Professor Laura Listenberger. I felt that the course model would be adaptable to an environmentally-themed course, and through a series of meetings we determined that such a course would not only be possible, but quite beneficial to the department and the student body.

I surveyed my peers and found that while many people were interested in the Environmental Studies department a variety of reasons kept them from enrolling in any of its classes. First on the list is time commitment. Most St Olaf students have more than one major, but regardless, all of them are busy. Many students are interested but have such full schedules that they don't have the room to fit in another full-credit course, especially one which does not count towards a major or a GE. The second reason manifested itself in two ways. Many students felt that they were not suited for the department, either because they held a prohibitive stereotype of the sort of curriculum and classmates they would find in an Environmental Studies course, or because they did not feel that they were knowledgeable enough to partake in a course. While understandable, each of these reasons denotes an opportunity for improvement in the department. In designing my course, I aimed to address these areas in hopes of inviting as many students as possible to enrich themselves and grow in their knowledge of the world.

For those with packed schedules, I felt it was important for the course to not carry a full credit but instead be small enough so that a student could easily add it to his or her schedule. Similarly, for students who were unsure whether they would enjoy an Environmental Studies class, and especially for those who questioned whether they could handle a full class, this small credit offering enables students to get their feet wet without sacrificing a coveted full-credit class. Finally, the course is designed to be based on reliable current research in order to back up environmental claims and phenomena with trust-worthy sources. The course is also designed to be flexible and inviting to all perspectives; it is inherently interdisciplinary, just like the field of environmental work.

My vision for the course is to have a discussion-oriented forum in which students are afforded the freedom to ask questions and seek answers. I hope that through the use of academic sources and collaboration, students may confront the confusion of the popular media and better grasp the nature of environmental issues. I envision lively weekly meetings, passionate discussions, and informed presentations. I hope that students will leave the class with a better understanding of environmental phenomena as well as an increased awareness of the interconnectedness of every discipline.

ES 291: Environmental Media: Fact or Fiction
Create Your Own Environmental Study
St. Olaf College, Fall 2011

Instructor: Dr. Green Thinker
Office: Regents Hall of Nat Sci
Phone: x Email: thinkgreen@stolaf.edu

Classes: Wednesday 2:00 – 4:00 pm
Regents Hall of Natural Sciences, Room 410

Course Description: Welcome to ES 291! In this course, we will explore current research into the scientific basis of some of the most prominent and complex environmental challenges in the world. We will begin with articles from the popular media as an introduction to each topic. We will then seek to deepen our knowledge of the issue by digging into academic sources and sharing our findings in a continuous class conversation.

Course format: This course is based on discussion and passion. The exploration of a particular topic will be largely student-directed. This course is an opportunity for you to dig into the questions that interest you and find answers to both enrich your understanding as well as that of your classmates.

The course is divided into four units. Each unit will begin with an article which touches on a relevant environmental issue. Through class discussion we will create a list of questions that we have about the issue and areas for exploration. Individual students will choose specific questions that they wish to pursue. They will seek answers to their question from primary literature sources and prepare a 10-15 minute presentation to share with the class the following week. After the first round of presentations, the class will prepare a second wave of questions for further exploration. This format is intended to push students to seek better answers and ultimately to see more questions.

Student Performance Objectives: While the main goal of the course is to gain a deeper understanding for the science behind environmental issues, as well as the multifaceted nature of environmental problem solving, students will also develop

- critical analysis of popular news and primary research articles
- identifying potential biases associated with different kinds of reference material
- communication of complex ideas through both formal oral presentation and informal discussion

My hope is that this course will encourage a passion for asking questions and seeking answers.

Expectations and Evaluation

Evaluation: Along with presenting two presentations on two of the four course topics (for a total of 4 presentations during the semester), there will be a midterm assignment as well as a final presentation or paper.

Attendance: Full attendance and punctuality are critical for the format of this course. If you are absent you will miss questions for your research and your chance for presentation and discussion with your group. In an emergency, contact me promptly to find out how to make up the material.

Presentation of literature research: Each week, you should expect to spend 10-15 minutes presenting your findings to the class including time for questions and discussion. Start your presentation with the question(s) to be answered. Why are they interesting and important? Cite the references used for the points you make. Try to stimulate discussion with your group. Use visual aids such as the whiteboard or powerpoint. Good humor is appreciated. End with conclusions and the take-home message or bottom line.

Your presentation will be evaluated on your ability to find and understand relevant sources, including primary research articles, and your ability to present the material you find in a manner that is accessible to the entire class.

Library Resources: St. Olaf is fortunate to have access to many journals. And, interlibrary loan is available for a large number of additional resources. If you are unfamiliar with databases for searching the primary literature (web of science, pubmed, endnote) please make an appointment to see Charlie Priore in the science library.

You may use textbooks, review articles, or other faculty as resources for the first week following the introduction of a new unit. However, library research presented in subsequent weeks must include at least one paper from the primary literature. Include citations for all of the material that you present each week. Think carefully about any biases or inaccuracies that may be inherent to your reference. Be prepared to defend your source(s) to the class.

Midterm and Final Project: The midterm and individual final problem will represent your own thinking and research. For the midterm, you will be given an article from the popular press. Your assignment is to state five questions that you have about the science in the article. Find a primary research article that addresses one of your questions. Include the full reference for your article (including the abstract) and write a brief statement to summarize what the article says to address your question.

For the final problem, you should choose an article from the popular press related to global climate change. Identify a question to pursue based on the article. Find two articles from the primary literature and discuss in detail how these articles address your question and deepen your understanding of the article. You have the option of preparing your final project as an oral report to the class or as a written report. Oral presentations will be given during the last two weeks of class (specific order TBA), while the written option is due in class on Wednesday, December 8.

Participation: The success of this course requires significant intellectual contribution from each and every class member. Therefore, I expect you to speak up in discussions, ask critical questions, and seek alternative points of view. You need to hold your classmates accountable for the material that they present. Ask for clarification on any point that you don't understand. To earn full credit for the participation component of this course you must attend every class period, stay engaged, and voice your questions and comments frequently.

Academic Integrity: St. Olaf expects integrity in all aspects of academic work and life. The St. Olaf Honor System applies to all assignments. More information on both the integrity policy and

honor code may be found online at www.stolaf.edu/stulife/thebook/academic/integrity.html and http://www.stolaf.edu/stulife/thebook/academic/honor.html.

Accommodations for Persons with Disabilities: If you have a documented disability for which accommodations may be required in this class, please contact Connie Ford (ford@stolaf.edu) in the Academic Support Center (x3288) located at the back of the Modular Village. If you already have documentation on file with Student Disability Services in the Academic Support Center you are required to present your letters to me within the first two weeks of class.

Adapted from Professor Laura Listenberger's syllabus for her Bio 291 course at St Olaf College.

Course Schedule for Bio 291: Molecular Mechanisms of Disease
Fall 2010

WEEK	DATE	TOPIC
1	Sept 14	Course introduction Introduction to Science Library and researching the primary literature Begin unit 1: Agriculture
2	Sept 21	Unit 1: Agriculture-presentations
3	Sept 28	Unit 1: Agriculture-presentations Begin unit 2: Water
4	Oct 5	Unit 2: Water-presentations
5	Oct 12	Unit 2: Water-presentations Midterm assignment available: Genetically modified organisms
6	Oct 19	Midterm assignments due Begin unit 3: Extractive Natural Resource Use and Acquisition
7	Oct 26	Unit 3: Natural Resources-presentations
8	Nov 2	Unit 3: Natural Resources-presentations Begin unit 4: Bioremediation
9	Nov 9	Unit 4: Bioremediation-presentations
10	Nov 16	Unit 4: Bioremediation-presentations
11	Nov 23	**THANKSGIVING BREAK**
12	Nov 30	Presentation of final projects
13	Dec 7	Presentation of final projects

The Simulation

In order to get a better feel for what a typical class session might consist of, I gathered a few friends together to hold a simulation of sorts. I intentionally invited only a few friends who had any experience taking courses in the ES department. Of those in attendance, only one was a major, while another had taken only one course in the department in his last semester at St Olaf. The other three had backgrounds in religion, Asian studies, computer science, nursing, Spanish, and political science. The composition of this group was intended primarily to get a good mix of students who are engaged, curious, and passionate about learning and discussion. I also used it as an opportunity to get a good idea of the capacity of a group of students who had not been formally educated by the department.

Before the class session began, I explained my vision for the course and the reason that they were all gathered there. I explained to them the format of the course and indicated to them that they would be taking part in an abbreviated version of what I hoped to see implemented. To begin, I presented the "class" with a short article from the New York Times (see attached article). From there, as I had explained to the class, we launched into a discussion of what the article had talked about. As hoped, our discussion consisted of a series of questions spanning multiple subject areas. We touched on ecology, technology, politics, the economy, corporate responsibility, and the government's involvement in funding and regulating the auto industry. At the end of the discussion I allowed each student to select the research question that interested them the most in so that they could a get a feel for what kind of liberty the class afforded in terms of topic exploration. I dismissed "class" after that and asked for their evaluation of the simulation.

The feedback I received from them was invaluable. Each student was extremely positive overall about the potential of the course. One student noted that she appreciated the student-run style of the class. Her opinion is that it is one of the more effective methods of learning because it allows a student to pursue those topics of the most interest to her (or him) and ground those interests in fact and concrete knowledge. Another students admitted that although she enjoyed the structure, she felt that it is important for each student to have at least some background in environmental studies because the professor is less involved and can't guide the discussion as well.

As expected, some students did feel shy asking questions, especially if they felt that they were obvious answers to students who were accustomed to studying environmental/science-related news. Most students stressed the importance of meeting once a week and having little outside work aside from the weekly presentations.

Overall what I took from this experience is that St. Olaf students want to learn and they want to talk--they just need to be given the opportunity. One of the benefits of having a class meet once a week with little homework and a low credit offering is that it takes the pressure off for students to focus on the work and the grades. The small credit amount makes it easy to fit this course into a full schedule, hopefully to the benefit of all other courses being taken. It also institutionalizes a regular focus group, which allows students to be able to commit to weekly conversations about current events and world issues. Ultimately this course aims to contribute to the St Olaf liberal arts education model by providing students with another perspective with which to understand the world.

The Discussion

- Is manufacturing that big of a deal? Do we need to make any effort to reduce emissions/impact?
- Where should we be putting our efforts towards sustainability?
- If we can't tackle the 80-90% yet is it better to address the 10-20% for the time being? Does that take resources away from being able to address the 80-90%?
- Soy products: all they're cracked up to be?
- Other methods and materials--how useful is soy? What other materials aside from dandelions and soy? (George and Colin--~~Katie thinks this is unjust~~)
- Production: look at cars on a different level; look at consumption of gas. Are we addressing the right areas of resource consumption?
- Ford cannot address this problem…Invest more in public transportation. Urban planning, etc. (Kelsey) and light rail. Refurbished elevated rail in NY turned into bike trails.
- Encourage innovation and research--do more! Don't be satisfied! We are going in an interesting direction, but not necessarily the best/right direction.
- The entire issue is sociological. If we can change how much people use their cars, what they choose as transportation, what the government funds as transportation available to the public.
- Issues with American lifestyle. We are programmed to not want limits or communal lifestyle. Sacrifice is incomprehensible. Gas tax in Europe is super high. We don't tolerate that here. Jimmy Carter went on the air and tried to promote conservation during energy crises (late 70s and 80s).
- Is this is a feasible option? Land use. They do grow like weeds. Is it cost-efficient? Is this feasible? Will this negatively impact the ecosystem? Why did this not get thought of before? "Green movement" promoted this?
- A lot of ideas have been around for a long time but no one was willing to listen
- A lot of things we talked about are outside of Ford's jurisdiction. So this is a good step for them. They could make a commitment to make a more fuel efficient vehicle. Car companies do not push past government regulations. California is the spearhead and pushes the government regulations. They make cars just for California.
- Government laws and policies already established and those sitting in committee. (Katie)
- Other ways to make production more efficient (Colin).

The New York Times
Wheels
The Nuts and Bolts of Whatever Moves You

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Ford Says There's Wealth in Weeds

By SEBASTIAN BLANCO

Ford is researching dandelions for their potential applications in plastics and rubber manufacture.

9:52 a.m. | Updated

Petroleum is found throughout passenger vehicles, not only in the gas tank. But Ford announced on Tuesday a project intended to minimize its reliance on petroleum-based vehicle components, and it chose an unlikely standard bearer: the dandelion.

Developed in collaboration with Ohio State University, the project harnesses the scourge of lawn tenders worldwide, Taraxacum kok-saghyz, commonly called the Russian dandelion, to produce a versatile, milky-white substance that can be used as a plastics modifier. The substance, Ford said, could find application in cup holders, floor mats and interior trim pieces, replacing synthetic rubber commonly used in these applications.

While rubber does literally grow on trees, synthetic rubber is a petroleum product, and even if all the rubber Ford used were sustainably grown, it still would be cleaner to produce plastic from locally sourced dandelions because shipping would be minimized.

The dandelion-based plastic has not reached Ford vehicles yet. Company engineers are still testing the substance to ensure its durability.

As far as its viability is concerned, Philip Gott, the managing director of IHS Automotive, an automotive-industry forecasting service, said that moves by large automakers to swap traditional, nonrenewable material for sustainable ones was an undeniably good thing.

"Far from 'greenwashing', there has been a longstanding effort on the part of industry to use natural plants to produce manufactured goods," he wrote in an e-mail. "I can tell you that my father worked on making rubber from the milk of milkweed during World War II, for example." Mr. Gott added that European automakers are also "looking at bio-feedstock for materials."

Ford has long tinkered with alternative materials, with Henry Ford using soy for some car parts in the 1920s. More recently, the company has pushed to get soy-based foam into vehicle seats. While that may seem like a small gesture, a modern vehicle uses from 30 to 40 pounds of foam, and Ford claims to use around 90 million pounds of it each year.

In 2008, the university worked with Bridgestone to try developing tires made from the Russian dandelion. Ford is also investigating making rubber from guayule, a shrub common to the Southwest.

Even so, moving to bio-based materials might not have the significant impact that automakers would like to project.

According to the E.P.A., Ford ranked third from the bottom out of all major automakers in terms of overall vehicle fuel economy and CO_2 emissions for 2008-10 model-year vehicles.

“Only about 10 to 20 percent of the emissions are tied up in manufacturing,” said Jim Kliesch, research director in the clean-vehicles program at the Union of Concerned Scientists, in a telephone interview. “So that leaves 80 to 90 percent to operating the vehicle and creating the fuel. What Ford is doing is admirable, but at the same time it’d make a lot more sense to improve the overall efficiency of their fleet.”

“I raise this simply to point out that Ford still has work to do,” Mr. Kliesch said.