

North Carolina State University Course Action Form**ES 300 – Energy and the Environment****Proposal Type:** New Course**Proposed Date:** Jan. 11, 2010**Department/Program:** Environmental Sciences Academic Program**Abbreviated Title:** Energy and the Environment**Scheduling:** Fall, in Every Year**Offerings:** On-Campus**Credit Hours:** 3**Contact Hours****Lecture/Recitation:** 3**Grading:** ABCDF or S/U**Enrollment per Semester:** 30**Enrollment Maximum per Section:** 30**Multiple Sections:** TBD**Repeatable:** No**Catalog Description**

The course will explore relationships between humans, energy, and environment with content from disciplines including natural and social sciences, engineering and materials, humanities, design, and education. Half of the course content is from subject lectures and half from self-selected student projects. Student projects emphasize analytical approaches to solving environmental problems, and enhance skills in writing, seminars, and team work.

Curriculum/Minors for Which Course is Designed

Environmental Sciences B.S.

Environmental Science Minor

Course Justification

The proposed course will contribute to the long-standing, academic goal of defining relationships between energy use by humans and the environment. The relationships between humans, energy, and environment are expressed by the disciplines that include the natural and social sciences, engineering and materials, humanities, design and education. As such the course will contribute to the need for NC State to address a basic, fundamental area of human need for knowledge. ES 300 will be proposed as a GEP Interdisciplinary Perspective Course and as a Global Knowledge course. Half of the course content is from subject lectures and half from self-selected student projects. The proposed course is the second in a sequence of ES core courses that are a progression of increasing student effort in building student projects.

Previous Enrollment

This course was previously offered as NR 491. The enrollment was 9 undergraduate students.

Resources Statement

This course was offered under NR 491, and no new resources will be needed.

Consultation With Other Departments

Materials describing the course were posted on the ESNR website, and notices inviting comments were sent to all colleges.

Prerequisites & Co-Requisites

None.

Instructors Responsible for Course

William E. Winner

General Education Program (GEP) List Action

GEP Category

Interdisciplinary Perspectives

GEP Category Outcomes

1. Distinguish between the distinct approaches of two or more disciplines.

Outcome 1. Students will understand the impacts of energy use on the environment recognizing distinct approaches of two or more disciplines including, engineering and materials science, physical sciences, life sciences, social sciences, design and humanities.

Means of Assessment. Students are assessed for distinguishing between disciplinary approaches in the two written examinations. An example of an examination question is:

“NC State University is building a new library on Centennial Campus, and it is to be LEED Silver. How does the engineer for the heating, cooling, and electrical system view the situation? How does the Office of Finance view the situation? How does the architect view the situation?” (Answer includes information and concepts from engineering, business, and design)

Student ability to distinguish between disciplines engaged in issues surrounding energy and the environment is assessed in the team project reports. The team report consists of chapters written by each student team member, and each student must have a unique, disciplinary perspective in their project. Each student must also see how their contribution creates dimension and context for the group. The individual chapters are assessed and graded, in a series of three drafts, for organization and content that requires the ability to develop a strong disciplinary analysis in an interdisciplinary framework.

2. Identify and apply authentic connections between two or more disciplines.

Outcome 2. Students will be able to see how the production and use of energy of energy connects to environmental resources in the context of two or more disciplines.

Means of Assessment. Students are assessed for their ability to connect ideas common to the themes of energy and environment in two written examinations. An example of an examination question is:

“Explain the North Carolina Renewable Energy Portfolio Standard. Why was this law so controversial and difficult to pass?” (Answer includes information and concepts from disciplines of public policy, physical science, energy and resource economics)

Students are assessed for their ability to connect disciplines by evaluating the synthesis in the team report consisting of chapters from each student. Team reports are assessed for connections between disciplines represented by individual students; report with well-developed connections will score highly for organization and content.

3. Explore and synthesize the approaches or views of the two or more disciplines.

Outcome 3. Students will synthesize approaches and views concerning energy and the environment from two or more disciplines including, engineering and materials science, physical sciences, life sciences, social sciences, design and humanities.

Means of Assessment. Students are assessed for their ability to synthesize interdisciplinary approaches to issues concerning energy and environment in two written examinations. An example of an examination question is:

“You are building a house, and are deciding between a wood burning fireplace or a fire place using natural gas logs. Your house lot includes several acres of trees. From the context of energy and environment, what are the three most important issues you are considering? What do you decide to do and why? (Answer includes information from physical sciences and ecology)

GEP Co-requisites

Global Knowledge

GEP Co-requisite Outcomes

1. Compare systematically the ideas, values, images, cultural artifacts, economic structures, technological developments or attitudes of people from different societies.

Outcome 1. Students will compare and analyze the disparity in energy use that exists between countries, cultures, and societies around the world.

Means of Assessment. Students are assessed for the ability to understand and analyze disparity in energy use that exists between countries in written examinations. An example of an examination question is:

“How does energy use at the national level differ between developed nations and developing nations? What is the ecological and the economic significance if disparity exists?”

2. Identify the historical context of ideas and cultural practices and their dynamic relations to other historical contexts.

Outcome 2. Students will understand the relationships between energy and environment in the world before humans, and develops ideas about the changing relationship between humans, energy, and environment from the origin of our species.

Means of Assessment. Written examinations will be used to assess student understanding of historical trends in the way humans use energy and the ability to cope with environmental change. An example of a sample examination question is:

“Diagram the global carbon cycle before industrial activity. Show sources and sinks of carbon. Show the global carbon cycle as we know it, today and explain changes, if any. How do changes in atmospheric CO₂ concentrations relate to primary productivity on a global scale?”

3. Explain how a culture changes in response to internal and external pressures.

Outcome 3. Students will understand how internal pressure to increase energy use in countries is tied directly to the need for economic growth, and the possible trade-off of environmental impacts.

Means of Assessment. Students are evaluated with written examinations to assess their understanding of cultural changes in response to internal and external pressures. An example of a sample question is:

“How much of the increase in global energy use is caused by human population growth? How much of the increase in global energy use is caused by economic growth? Based on historical trends, project increases in population and energy use in the United States and in India over the next 20 years.”

Course Syllabus

ES 300 – Energy and the Environment

Section 001

SPRING 2010

3 Credit Hours

Course Description

The concepts of energy and the environment touch all academic disciplines and personal values. This course will explore the dimensions of energy and the environment from a range of perspectives, including the environmental impacts of energy use and change in energy use in response to environmental and social needs. To further embrace the interdisciplinary discussion and study of energy and the environment, the course will focus on five themes, with each presented by an expert in the subject matter. The 16 week semester will be divided between the following five focal areas:

1. Energy Production, Distribution & Use (Fossil Fuels, Biofuels, Nuclear Power, Alternative Sources, Grids, Combustion)
2. Environmental Impacts of Energy Use (Toxicology, Pollutants, Climate Change)
3. Energy Use and Environment at NC State University
4. New Energy Sources and Technologies (Renewable Energy, Energy Conservation, Mitigating Environmental Impacts)
5. Energy Use, Environment & Society (Business, Economics, Law, Management)

To ensure integration of thinking across the focal areas, the students will attend lectures, and will develop interdisciplinary team projects during the semester that reinforce concepts related to energy use and the environment. Students completing the course will understand the basic concepts of environmental energy production and use and linkages to environmental systems and resources.

Learning Outcomes

1. Understand interdisciplinary discussions of energy and the environment.
2. Identify key mechanisms in relationships between energy and environment.
3. Comprehend energy and environment issues on a local, national and global perspective.
4. Understand the process of evaluating effects of energy use on the environment.
5. Increase skills necessary to communicate to topics related to energy and the environment.
6. Develop respect for diversity of values, thinking, approaches, and disciplines connected to analysis of linkages between energy and environment.

Course Structure

Class periods on Tuesdays are dedicated to subject lectures. The goal of the lectures is to ensure students develop a basic understanding of concepts of energy and the environment. The lecturers presenting content for the theme areas will work with the coordinator to integrate concepts.

Class periods on Thursdays are dedicated to work on student projects. The goals of the student projects are to reinforce the concepts of environmental sustainability, to provide inquiry based learning, to provide service-learning, to present students with real work demands, and to improve written and oral communication skills. Student projects will emphasize analytical writing and communication skills. Students will complete projects by contributing a chapter to a team report, and each team will present a seminar on their work at the end of the semester. Students will self-select teams, and topics for projects.

Instructors

William E Winner (wewinner) - *Instructor*

Email: wewinner@ncsu.edu

Web Page: www.ncsu.edu/esnr

Phone: 919-515-5780

Office Location: 2231 Jordan Hall Addition

Office Hours: By Appointment

Course Meetings**Lecture**

Days: TH

Time: 1:30pm - 2:45pm

Campus: Main

Location: TBD

This meeting is required.

Course Materials

None.

Requisites and Restrictions

None.

General Education Program (GEP) Information**GEP Category**

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Transportation

This course will not require students to provide their own transportation. Non-scheduled class time for field trips or out-of-class activities is NOT required for this class.

Safety & Risk Assumptions

None.

Grading

Grade Components

Component	Weight	Details
Exam I	40 points	10/05/2010

Component	Weight	Details
Exam II	60 points	12/2010
First Draft	10 points	9/23/2010
Second Draft	20 points	10/21/2010
Final Draft	50 points	11/11/2010
Seminar	10 points	11/30/2010-12/02/2010
Team Report	10 points	11/30/2010

Letter Grades

This Course uses Standard NCSU Letter Grading:

$97 \leq A+ \leq 100$
 $93 \leq A < 97$
 $90 \leq A- < 93$
 $87 \leq B+ < 90$
 $83 \leq B < 87$
 $80 \leq B- < 83$
 $77 \leq C+ < 80$
 $73 \leq C < 77$
 $70 \leq C- < 73$
 $67 \leq D+ < 70$
 $63 \leq D < 67$
 $60 \leq D- < 63$
 $0 \leq F < 60$

Requirements for Credit-Only (S/U) Grading

In order to receive a grade of S, students are required to take all exams and quizzes, complete all assignments, and earn a grade of C- or better. Conversion from letter grading to credit only (S/U) grading is subject to university deadlines. Refer to the Registration and Records calendar for deadlines related to grading. For more details refer to http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.15.php.

Requirements for Auditors (AU)

Information about and requirements for auditing a course can be found at http://www.ncsu.edu/policies/academic_affairs/pols_regs/REG205.00.5.php.

Policies on Incomplete Grades

If an extended deadline is not authorized by the instructor or department, an unfinished incomplete grade will automatically change to an F after either (a) the end of the next regular semester in which the student is enrolled (not including summer sessions), or (b) the end of 12 months if the student is not enrolled, whichever is shorter. Incompletes that change to F will count as an attempted course on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student. The university policy on incomplete grades is located at http://www.ncsu.edu/policies/academic_affairs/grades_undergrad/REG02.50.3.php.

Late Assignments

Students are responsible for completing assignments and submitting them by the deadlines given by instructors. Late assignments will only be accepted in the case of verified/documentated emergencies. See the University Attendance Policy.

http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.3.php

Attendance Policy

Attendance

Attendance is required. After two unexcused absences, two points may be deducted from the final score for each additional absence. This policy is based upon NCSU Attendance Policy:

http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.3.php

Absences

In case of emergency (serious illness, injury, death, or illness in the family, university duties, court attendance, or religious observance), please notify me as soon as possible. This policy is based upon NCSU Attendance Policy:

http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.3.php

Makeup Work

You are responsible for all work missed and for any assignment announced on the day you were absent. This policy is based upon NCSU Attendance Policy:

http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.3.php

Academic Integrity

Academic Integrity

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at

http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php

Students are bound by academic integrity policy as stated in NCSU Code of Student Conduct.

Academic Honesty

See http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php for a detailed explanation of academic honesty.

Students are required to uphold the University Pledge of Honor and exercise honesty in completing every assignment.

Honor Pledge

Your signature on any test or assignment indicates "I have neither given nor received unauthorized aid on this test or assignment."

Electronically-Hosted Course Components

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

Electronically-hosted Components: <http://vista.ncsu.edu>

Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (<http://www.ncsu.edu/dso>) located at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at

http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php.

Policy on Discrimination

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at http://www.ncsu.edu/policies/campus_environ or http://www.ncsu.edu/equal_op. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 515-3148.

Course Schedule

Lecture TH 1:30pm - 2:45pm — Week 1 — 08/19/2010 - 08/19/2010

Introductions and Course Overview, Define Student Teams

Lecture TH 1:30pm - 2:45pm — Week 2 — 08/24/2010 - 08/26/2010

Tuesday: Lecture 1, Energy Production, Distribution & Use I

Thursday: Teamwork, Discuss Analytical Approaches, Work on Team Outlines

Lecture TH 1:30pm - 2:45pm — Week 3 — 08/31/2010 - 09/02/2010

Tuesday: Lecture 2, Energy Production, Distribution & Use II

Thursday: Teamwork, Work on Individual Outlines, Start First Draft

Lecture TH 1:30pm - 2:45pm — Week 4 — 09/07/2010 - 09/09/2010

Tuesday: Lecture 3, Energy Production, Distribution & Use III

Thursday: Teamwork. Work on First Draft

Lecture TH 1:30pm - 2:45pm — Week 5 — 09/14/2010 - 09/16/2010

Tuesday: Lecture 4, Environmental Impacts of Energy Use I

Thursday: Work on First Draft

Lecture TH 1:30pm - 2:45pm — Week 6 — 09/21/2010 - 09/23/2010

Tuesday: Lecture 5, Environmental Impacts of Energy Use II

Thursday: Submit First Draft to Team Members for Grading

Lecture TH 1:30pm - 2:45pm — Week 7 — 09/28/2010 - 09/30/2010

Tuesday: Lecture 6, Environmental Impacts of Energy Use III

Thursday: Teamwork, Return First Drafts to Authors, Begin Second Draft

Lecture TH 1:30pm - 2:45pm — Week 8 — 10/05/2010 - 10/07/2010

Tuesday: Exam I

Thursday: No Class, Fall Break

Lecture TH 1:30pm - 2:45pm — Week 9 — 10/12/2010 - 10/14/2010

Tuesday: Lecture 7, Energy Use and Environment at NC State University I

Thursday: Teamwork, Work on Second Draft

Lecture TH 1:30pm - 2:45pm — Week 10 — 10/19/2010 - 10/21/2010

Tuesday: Lecture 8, Energy Use and Environment at NC State University II

Thursday: Teamwork. Submit Second Draft to Instructor

Lecture TH 1:30pm - 2:45pm — Week 11 — 10/26/2010 - 10/28/2010

Tuesday: Lecture 9, New Energy Sources and Technologies I
Thursday: Teamwork, Second Draft Returned to Author, Begin Final Draft

Lecture TH 1:30pm - 2:45pm — Week 12 — 11/02/2010 - 11/04/2010

Tuesday: New Energy Sources and Technologies II
Thursday: Work on Final Draft

Lecture TH 1:30pm - 2:45pm — Week 13 — 11/09/2010 - 11/11/2010

Tuesday: Lecture 11, Energy, Environment & Society I
Thursday: Teamwork, Submit Final Draft, Begin Team Report

Lecture TH 1:30pm - 2:45pm — Week 14 — 11/16/2010 - 11/18/2010

Tuesday: Lecture 12, Energy, Environment, and Society II
Thursday: Teamwork, Work on Final Draft Team Report

Lecture TH 1:30pm - 2:45pm — Week 15 — 11/23/2010 - 11/25/2010

Tuesday: Lecture 13, Energy, Environment & Society III
Thursday: No Class, Thanksgiving Break

Lecture TH 1:30pm - 2:45pm — Week 16 — 11/30/2010 - 12/02/2010

Tuesday: Submit Final Report, Student Seminars
Thursday: Student Seminars

Lecture TH 1:30pm - 2:45pm — Week 17 — 12/2010 - 12/2010

Final Exam

SIGNATURE PAGE

COURSE ACTION FOR ES 300

Recommended By

HEAD, DEPARTMENT/PROGRAM

Date

Endorsed By

CHAIR, COLLEGE COURSES & CURRICULA COMMITTEE

Date

COLLEGE DEAN

Date

Approved By

CHAIR, UNIVERSITY COURSES & CURRICULA COMMITTEE

Date

CHAIR, COUNCIL ON UNDERGRADUATE EDUCATION

Date

DEAN OF UNDERGRADUATE ACADEMIC PROGRAMS

Date

Approved Effective Date