

North Carolina State University Course Action Form**ES 200 – Climate Change and Sustainability****Proposal Type:** New Course**Proposed Date:** Jan. 11, 2010**Department/Program:** Environmental Sciences Academic Program**Abbreviated Title:** Climate Change & Sustain.**Scheduling:** Fall, in Every Year**Offerings:** On-Campus**Credit Hours:** 3**Contact Hours****Lecture/Recitation:** 3**Grading:** ABCDF or S/U**Enrollment per Semester:** 40**Enrollment Maximum per Section:** 40**Multiple Sections:** TBD**Repeatable:** No**Catalog Description**

The course explores the relationships between humans and the environment with content from disciplines including natural sciences, social sciences, humanities, engineering and materials, design, and education. Course content is based on lectures with students also responsible for developing and presenting seminars.

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 the relationships between humans and the environment. Curiosity about climate and sustaining future generations is basic to human nature and expressed in all disciplines including natural sciences, social sciences, humanities, engineering and materials, design and education. The course will enhance the capacity for NC State to address a basic, fundamental area of human need for knowledge. ES 200 will be proposed as a GEP Interdisciplinary Perspective course and Global Knowledge course. ES 200 is the second of four ES core courses, with 90% of content lecture based and 10% based on student seminars. The course is the second step in the sequence of four ES core courses that are a progression of increasing student effort in building student projects.

Previous Enrollment

The course was previously offered in the fall of 2008, as a NR Special Topics course. The enrollment was 9 undergraduate students.

Resources Statement

This course has previously been 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 be able to analyze and evaluate the approaches to assessing climate change and sustainability from the perspective of at least two disciplines from among the following: physical sciences, life sciences, engineering and materials science, social sciences, design, and humanities.

Means of Assessment. Student understanding of the role of disciplines to the issues of climate change and sustainability is assessed with two written examinations. Each examination has a section requiring students to define specific terms within the context of the course themes, and some terms used in the examinations will be from specific disciplines. Examinations also include short answer questions where students bring together elements of specific disciplines as parts of an answer.

Examples of discipline specific terms students explain or define on examinations:

Cellulosic biomass (The answer should include information from biology and chemistry)

Public interest groups (The answer should include information from public policy and sociology)

An example of short answer examination question involving at least two disciplines is:

“NC State University is becoming more sustainable by increasing efficiency of transportation. List two policies and two technical approaches being employed, and resolve whether the policies or technical approaches are more effective.” (The answer should bring in elements of two or more disciplines such as engineering, physical science, public policy, and sociology)

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

Outcome 2. Students will be able to see the relationships between concepts on climate change and sustainability presented by instructors from different disciplines.

Means of Assessment. Student ability to identify and apply connections between two or more disciplines will be assessed with written examinations given at midterm and end of semester. A part of the examinations requires students to define and explain terms within the context of the course, and some terms will require connecting disciplines. A part of each examination includes short answer questions, some of which require connecting disciplines.

Examples of discipline specific terms students explain or define on examinations are:

“North Carolina’s Renewable Energy Portfolio Standard” (Answer should contain information from disciplines of public policy/physical sciences)

“Life Cycle Analysis” (Answer should contain information from disciplines including engineering/business)

An example of short answer examination question connecting two disciplines is:

“You are elected President of the United States and campaigned to write a Sustainability Bill. How do you begin creating the bill, what is in it, and how does it connect to other environmental legislation?” (Answer should contain information from disciplines including life science, physical science, public policy)

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

Outcome 3. Students will be able to analyze interdisciplinary aspects of climate change and sustainability issues using two or more disciplines.

Means of Assessment. Students will present seminars on self-selected themes. Students work on interdisciplinary teams with each student bringing their own point of view, area of expertise, and unique background. The team seminar must deliver a comprehensive message composed of individual contributions. The seminars are evaluated for mechanical issues such as format and quality of graphics. Seminars are also evaluated for organization and content where analysis, synthesis, and communication skills. The evaluation of organization and content includes the need to provide an interdisciplinary analysis connected to at least two disciplines, and working to integrate diversity of thinking and values into a common message.

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 aspects of global climate change impacts between nations and cultures, and how ecosystems around the world are affected by human activity.

Means of Assessment. The ability of students to compare global change impacts between nations and cultures is assessed in the two written examinations. An example of a short answer question is:

“Explain how and why the United States and China play different roles in changing the global carbon cycle.”

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

Outcome 2. Students will be able to explain the relationships between climate change and sustainability in the world before humans, and develop ideas about the changing relationship between humans, climate, and environmental systems from the origin of our species.

Means of Assessment. The assessment of historical trends in human understanding of sustainability and environmental change is assessed in the two written examinations. An example short answer question is:

“Explain how the global carbon cycle has changed during the past 1,000 years, and how humans adapted to climate change during this period.”

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

Outcome 3. Students will learn how internal and external pressures for economic growth are expressed in the concept of sustainable development in the face of climate change.

Means of Assessment. Students understanding of cultural responses to internal and external pressures is assessed in the two written examinations. An example of a short answer question in the written examination is:

“Identify three ways that the pressure for economic development will accelerate climate change. Identify three ways that pressure for economic development will mitigate climate change.”

Course Syllabus

ES 200 – Climate Change and Sustainability

Section 001

FALL 2010

3 Credit Hours

Course Description

This course will explore the concepts of climate change, environmental sustainability, and sustainable development from interdisciplinary perspectives. Climate change content extends from millennia and to future predictions. "Environmental sustainability" is explored through lectures on biogeochemical cycles, and how they are affected by human activity. "Sustainable development" is discussed from the context of people meeting their current needs without compromising the ability of future generations to meet their needs. Students will assemble into teams of 4-6 and work through the semester to produce a seminar for the class. The course will be interdisciplinary, open to students from all colleges, and will focus on five themes:

1. Climate Change, Sustainability & Natural Resources (Agriculture, Forestry, Water, Soil, Air)
2. Climate Change, Sustainability & Energy (BioEnergy, Nuclear Power, Renewable Sources, Conservation)
3. Climate Change, Sustainability & NC State University (Use of Energy, Water, and other Resources)
4. Climate Change, Sustainability and Society (Business, Economics, Politics, Sociology, Law)
5. Climate Change, Sustainability & Issues of Scale (Residential-Global, Seconds-Millenia- Centuries)

To ensure integration of thinking across the focal areas, students will attend interdisciplinary lectures that include "Touchstone" topics addressed by all lecturers. Students will form self-selected teams to

present seminars that the end of the semester. Students completing the course will understand the basic concepts of climate change and sustainability, and will be prepared to take more specialized courses in a field.

Learning Outcomes

1. Learn fundamental concepts of climate change and environmental sustainability
2. Develop systems views of sustainability and the ability to see connections between disciplines
3. Improve abilities in analytical thinking and communication about climate change and sustainability
4. Become aware of how sustainability will bring change to life style and affect personal choices.

Course Structure

Course content will be 90% subject matter lectures, and 10% student seminars.

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: 11:45am - 1:00pm

Campus: Main

Location: TBD

This meeting is required.

Course Materials

Expenses

Student may incur extra expenses associated with the course. Expenses could include photography, photocopying, printing, ordering special materials, and travel. Students will assume the extra expenses.

Requisites and Restrictions

None.

General Education Program (GEP) Information

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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.

Grading**Grade Components**

Component	Weight	Details
Exam I	40 points	October 5, 2010
Exam II (Final)	50 points	December 2010
Seminar	10 points	November 23- December 2, 2010

Letter Grades

This Course uses Standard NCSU Letter Grading:

97≤A+ ≤ 100

93≤A < 97

90≤A- < 93

87≤B+ < 90

83≤B < 87

80≤B- < 83

77≤C+ < 80

73≤C < 77

70≤C- < 73

67≤D+ < 70

63≤D < 67

60≤D- < 63

0≤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 the NCSU Attendance Policy:

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

Absences

In case of emergencies (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 the 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 the 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 the academic integrity policy as stated in the 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 11:45am - 1:00pm — Week 1 — 08/19/2010 - 08/19/2010

Introductions, Course Overview, Definitions, Define Terms

Lecture TH 11:45am - 1:00pm — Week 2 — 08/24/2010 - 08/26/2010

Tuesday: Lecture 1, Climate Change, Sustainability, & Natural Resources I

Thursday: Lecture 2, Climate Change, Sustainability & Natural Resources II; Discuss Student Seminars

Lecture TH 11:45am - 1:00pm — Week 3 — 08/31/2010 - 09/02/2010

Tuesday: Lecture 3, Climate Change, Sustainability & Natural Resources III

Thursday: Lecture 4, Climate Change, Sustainability & Natural Resources IV; Discuss Student Seminars

Lecture TH 11:45am - 1:00pm — Week 4 — 09/07/2010 - 09/09/2010

Tuesday: Lecture 5, Climate Change, Sustainability & Natural Resources V

Thursday: Lecture 6, Climate Change, Sustainability & Natural Resources VI; Organize Student Seminars

Lecture TH 11:45am - 1:00pm — Week 5 — 09/14/2010 - 09/16/2010

Tuesday: Lecture 7, Climate Change, Sustainability & Energy I

Thursday: Lecture 8, Climate Change, Sustainability & Energy II; Students Work on Seminars

Lecture TH 11:45am - 1:00pm — Week 6 — 09/21/2010 - 09/23/2010

Tuesday: Lecture 9, Climate Change, Sustainability & Energy III

Thursday: Lecture 10, Climate Change, Sustainability & Energy IV; Students Work on Seminars

Lecture TH 11:45am - 1:00pm — Week 7 — 09/28/2010 - 09/30/2010

Tuesday: Lecture 10, Climate Change, Sustainability & Energy V

Thursday: Lecture 11, Climate Change, Sustainability & Energy VI; Reports to Class

Lecture TH 11:45am - 1:00pm — Week 8 — 10/05/2010 - 10/07/2010

EXAM I

NO CLASS, FALL BREAK

Lecture TH 11:45am - 1:00pm — Week 9 — 10/12/2010 - 10/14/2010

Tuesday: Lecture 12, Climate Change, Sustainability & NC State University I

Thursday: Lecture 13, Climate Change, Sustainability & NC State University II; Students Work on Seminars

Lecture TH 11:45am - 1:00pm — Week 10 — 10/19/2010 - 10/21/2010

Tuesday: Lecture 14, Climate Change, Sustainability & NC State University III

Thursday: Lecture 15, Climate Change, Sustainability & NC State University IV; Students Work on Seminars

Lecture TH 11:45am - 1:00pm — Week 11 — 10/26/2010 - 10/28/2010

Tuesday: Lecture 16, Climate Change, Sustainability & Society I

Thursday: Lecture 17, Climate Change, Sustainability & Society II; Students Work on Seminars

Lecture TH 11:45am - 1:00pm — Week 12 — 11/02/2010 - 11/04/2010

Tuesday: Lecture 18, Climate Change, Sustainability & Society III

Thursday: Lecture 19, Climate Change, Sustainability & Society IV; Students Work on Seminars

Lecture TH 11:45am - 1:00pm — Week 13 — 11/09/2010 - 11/11/2010

Tuesday: Lecture 20, Climate Change, Sustainability & Society V

Thursday: Lecture 21, Climate Change, Sustainability & Society VI; Students Work on Seminars

Lecture TH 11:45am - 1:00pm — Week 14 — 11/16/2010 - 11/18/2010

Tuesday: Lecture 22, Climate Change & Sustainability: Scale, Time and Space I

Thursday: Lecture 23, Climate Change & Sustainability: Scale, Time & Space II, Student Seminars

Lecture TH 11:45am - 1:00pm — Week 15 — 11/23/2010 - 11/25/2010

Student Seminars

Thanksgiving Break

Lecture TH 11:45am - 1:00pm — Week 16 — 11/30/2010 - 12/02/2010

Student Seminars

Student Seminars

Lecture TH 11:45am - 1:00pm — Week 17 — 12/2010 - 12/2010

Exam II (Final)

SIGNATURE PAGE

COURSE ACTION FOR ES 200

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