NAME OF DEGREE PROGRAM: BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE, MAJOR IN GEOGRAPHY & THE ENVIRONMENT

EXPLAIN CHANGE(S) TO DEGREE PROGRAM: Addition of a new degree and major in the College of Liberal Arts

Indicate pages in the undergraduate catalog where changes will be made. Begin Bachelor of Science in Environmental Science on page 332 (approximately), before the Bachelor of Science in Psychology and after the Bachelor of Arts Plan II, replacing the now-defunct Bachelor of Science in Geography and the Environment.

GIVE A DETAILED RATIONALE FOR CHANGE(S):
The market for environmental scientists/specialists continues to expand at an increasing rate in the US, and notably in Texas. Environmental science is a broad category that includes a wide array of biological fields, from study of impacts of environmental degradation on human health, to conservation management and policy, to more distant fields where environmental science and technology training are advantageous, such as risk management in the context of a changing environment. The online Socrates occupation profile system shows that environmental scientist and specialist positions, with appropriate technology-intensive training and education, is expected to increase nearly 24% over the next six years, with 44% of the annual job openings coming from growth (rather than replacement). The documented average turnover rate indicates high career longevity for appropriately educated candidates; current percentages of females and minorities (21% and 19% respectively) are some of the highest for scientific careers and offer the university and state of Texas a clear opportunity to increase workforce diversity in important scientific fields.

Environmental science is an area of strong and growing interest among incoming and current students at the university, particularly among biology and geography-oriented students, yet no designated program of study is available to them. There is no doubt that UT Austin is failing to recruit and retain top undergraduate students as a result of this.

Environmental challenges are among the greatest our society faces, and science provides the means to understand the nature, extent and impacts of environmental problems including climate change, loss of biodiversity, and threats to water resources, food supplies and other basic needs derived from the natural environment. Traditional disciplinary approaches to these problems do not provide comprehensive understanding of environmental processes under natural and human-perturbed scenarios. Developing the path to sustainable solutions to these challenges requires students to be trained in novel ways, where the development of an interdisciplinary perspective is a core principle.

Acting on the finding by the Commission of 125 that the university’s undergraduate core was outmoded, the Task Force on Curricular Reform recommended in its 2005 report an emphasis on increasing the interdisciplinary component in the core. An
independent set of recommendations by Dr. David Hillis also emphasized the importance of interdisciplinary educational experiences.

There is a clear need for interdisciplinary expertise to address the complex and dynamic nature of processes of the earth and its environment, including social science perspectives such as policy and economics. The lack of interdisciplinary scientists, as well as policy makers conversant in science and vice versa, has posed serious obstacles to making progress on major environmental issues such as climate change, water resource sustainability, and biodiversity preservation.

The challenge for developing any environment-related degree plan is the course-intensive nature of providing interdisciplinary expertise that is not overly broad and shallow. This is a common affliction of environmental BS and BA degrees at other institutions. Prospective employers and top-tier graduate programs, which are invariably disciplinary, do not give high rankings for employment/admission to students with such ‘shallow’ degrees. We thus stand to do students more harm than good if we follow this lead. Rather, UT Austin has the opportunity to become known for an Environmental Science degree with high-quality, rigorous training in the sciences as its core, coupled with exposure to appropriate social science fields (e.g. economics and policy) to provide breadth.

Prospects for UT Austin in developing a distinctive environmental sciences degree are enhanced by an excellent faculty base across many environmental science-related disciplines (with noted international strengths in geology and biology). In addition, UT has access to unique local resources and teaching opportunities on campus, in the Austin area, and in the central and south Texas region, including 1) Multiple university field stations or affiliated preserves within 2 hours of the main campus (e.g. Stengl, Bee Cave Eco-Lab and Chaparral), 2) An instructional field, research and teaching lab within 15 minutes of the main campus (Brackenridge Field Laboratory), 3) Opportunities for both research and educational outreach via the Wildflower Center and the Texas Natural Science Center, 4) Opportunities for marine and coastal research and field training in the Gulf Coast estuaries and the Mission-Aransas National Estuarine Research Reserve, 5) Formal classes, laboratory training and research mentoring in marine/coastal sciences at the Marine Sciences Institute at Port Aransas, and 6) Organizational support for the EVS degree, research/training coordination and student guidance from the Environmental Sciences Institute.

SCOPE OF THE PROPOSED CHANGE(S):
Does this proposal impact other colleges/schools? If yes, then how? Yes, the BS Environmental Science degree will be offered in three colleges: College of Natural Sciences, College of Liberal Arts and the Jackson School of Geosciences. The three environmental science degrees will share a common core. The faculty and associate deans of each participating college have been collaborating on the development of degree requirements and will continue to work together to manage core course offerings and advising for all majors.

Has the other college(s)/school(s) been informed of the proposed change? If so, please indicate their response. Yes, the proposed Bachelor of Science in Environmental Science has been discussed, reviewed, and agreed to by Deans Eric Barron, Mary Ann
Rankin, and Randy Diehl, and Associate Deans David Laude and Richard Flores, as well as Prof. Jay Banner, Director of the Environmental Sciences Institute, Sharon Mosher, Chair of the Department of Geological Sciences, and by Department of Geography and the Environment faculty. Since then The Jackson School of Geosciences has named a new dean and department chair. Both Dean Sharon Mosher and Stephen Grand, chair of the Department of Geological Sciences have also reviewed and agreed to the proposed EVS degree. Prof. Kenneth Young, the new chair of the Department of Geography and the Environment, has also reviewed and given his approval for the new degree.

**Date of initial approval:** April – May 2007.

**Will this proposal change the number of required hours for degree completion?** If yes, please explain. No.

**Does this proposal involve changes to the core curriculum?** If yes, please explain. No.

**COLLEGE/SCHOOL APPROVAL PROCESS:**
Environmental Sciences Degree Plan Committee Approval: May 2, 2009
Dept. of Geography/Env Approval: May 29, 2009
College Approval Date: October 2, 2009
Dean Approval Date: October 28, 2009

**ADDITION OF THE BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE DEGREE WITH A MAJOR IN GEOGRAPHY AND THE ENVIRONMENT IN THE COLLEGE OF LIBERAL ARTS CHAPTER OF THE UNDERGRADUATE CATALOG, 2010-2012**

**BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE**

The Bachelor of Science in Environmental Science degree program is designed for students interested in an interdisciplinary scientific perspective on environmental and sustainability issues, analysis and management. The major provides the broad foundation in physical, life and social sciences necessary to pursue a career and/or graduate study in environmental science and related fields such as climate change, ecology or conservation. Students successfully completing the program will be able to critically assess environmental issues from multiple perspectives; perform field, laboratory and computer analyses; and conduct original research. Degree recipients will be prepared for careers in local, state and federal government laboratories or non-profit agencies, environmental consulting firms, environmental education/outreach, and university or other research settings. The BS Environmental Science degree with a major in Geography and the Environment shares common prescribed work with the BS Environmental Science degree programs in Biological Sciences and Geological Sciences. Each degree has its own specific major requirements. Students may earn only one Bachelor of Science in Environmental Science degree.
All students must complete the University’s core curriculum as described in chapter 2. The specific requirements for the Bachelor of Science in Environmental Science consist of prescribed work (below), major requirements, and electives. In some cases, a course that is required for the BS Environmental Science may also be counted toward the core curriculum. Additionally, for the major in Geography and the Environment, courses used for the University core or prescribed work areas may also be used toward the major requirements where applicable.

A course in one prescribed work area may not also be used to fulfill the requirements of another prescribed work area; the only exception to this rule is that a course that fulfills another requirement may also be used to fulfill the writing requirement if the course has a writing flag.

**PRESCRIBED WORK**

1. **Mathematics:** Mathematics 408C, or 408N and 408S.
2. **Chemistry:** Chemistry 301 or 301H; 302 or 302H; and 204.
3. **Physics:** Physics 317K and 117M, or four hours of another calculus-based physics sequence.
4. **Biological Sciences:** Biology 311C and 311D, or 315H.
5. **Ecology:** Biology 373 and 373L, or Marine Sciences 320 and either 120L or 152T (Topic: Marine Ecology).
6. **Geological Sciences:** Geological Sciences 302P, 401 or 303, and 346C.
7. **Geography:** Geography 335N.
8. **Field Experience:** One course from each of the following lists:
   a. *Introductory Field Seminar:* EVS 311.
   b. *Senior Field/Research Experience:* EVS 371, or GRG 373F Field Techniques or 373K Field Methods for Landscape Characterization.
9. **Research Methods:** EVS 331.
10. **Environmental and Sustainability Themes:** One course from each of the following thematic areas:
    a) **Environmental and Sustainability Policy, Ethics & History:** Philosophy 325C, Geography 334, 336C, 340D, 342C, 356C, 356T (approved topics only)
    b) **Geographic Information Systems:** Geological Sciences 327G, Geography 360G, 462K
    c) **Climates & Oceans:** Biology 456L, Geological Sciences 371C (approved topics only), 377P, Geography 333K, 356T (approved topics only), Marine Sciences 320, 340, 354O, 354T, 367K. Marine Sciences 320 may not be used to satisfy both requirements 5 and 10.
    d) **Environmental Economics, Sustainability and Business:** Economics 304K, 330T, International Business 372 (approved topics only), Marketing 372 (approved topics only).
11. **Senior Seminars:** EVS 141 and 151.

**ADDITIONAL LIBERAL ARTS PRESCRIBED WORK**

1. **Writing:** Two courses beyond RHE 306 or its equivalent identified with a writing flag. One of these courses must be upper-division. Courses that meet this requirement are identified in the *Course Schedule*. They may be used simultaneously to fulfill other requirements, unless otherwise specified.
2. **Foreign language/culture:** One of the following foreign language/culture choices:
   a. Second-semester-level proficiency in a foreign language.
b. First-semester-level proficiency in a foreign language and a three-semester-hour course in the culture of the same language area.

c. Two three-semester-hour culture courses chosen from one foreign culture category from an approved list available in the Environmental Science Institute’s advising office. Courses taken to attain a certain level of proficiency in a foreign language are not electives and cannot be taken on the pass/fail basis.

3. Social science: Three semester hours chosen from an approved list of social science courses are required, in addition to the course counted toward the social science area of the core curriculum. The course must be taught in the College of Liberal Arts and must be in a different field of study from the course used to fulfill the University core social science requirement. Courses on the approved list will be primarily in the fields of anthropology, economics, geography, linguistics, psychology, and sociology, but not every course in these fields will be approved. Courses approved for an area of the University Core other than the social science area may not be used for this requirement.
   
   All designated social science courses must meet the following student competencies.
   
   a. To demonstrate and communicate an understanding of some of the methods, approaches, technologies, theories and data that social scientists use to investigate the human condition.
   
   b. To examine social institutions and processes across a range of historical periods and/or to understand the effects of historical, social, political, economic, cultural, or global forces on individuals and societies.

   A list of approved courses is available each semester in the Student Division and at http://www.utexas.edu/cola/student-affairs/Academic-Planning/Majors-and-Degrees/Course-Lists.php.

4. Cultural expression, human experience and thought: Three semester hours of designated coursework from the cultural expression, human experience and thought area are required in addition to the course counted toward the visual and performing arts area of the core curriculum. The course must be taught in a field of study in the College of Liberal Arts.
   
   All designated cultural expression, human experience and thought courses must meet the following student competencies.
   
   1. To demonstrate awareness of the scope and variety of human thought and expression across time.
   
   2. To understand expressions and experiences of individuals and/or groups within historical and social contexts and to articulate an informed reaction to these expressions and experiences.

   A list of approved courses is available each semester in the Student Division and at http://www.utexas.edu/cola/student-affairs/Academic-Planning/Majors-and-Degrees/Course-Lists.php.

5. Global cultures flag: One course identified in the course schedule with a global cultures flag. To satisfy the global cultures flag, at least one-third of the course grade must be based on content dealing with the cultures and perspectives of a non-U.S. community, country, or coherent regional grouping of countries, past or present; additional criteria is identified at http://www.utexas.edu/ugs/core/flags/guidelines. The course used to fulfill the global cultures flag may also be used to satisfy any other core or degree requirement. A single course may not carry both the global cultures and the cultural diversity in the United States flags simultaneously.

6. Cultural diversity in the United States flag: One course identified in the course schedule with a cultural diversity in the United States flag. To satisfy the cultural diversity in the United States flag, at least one-third of the course grade must be based on content dealing with the culture, perspectives, and history of one or more underrepresented cultural groups in the United States; additional criteria is identified at
The course used to fulfill the cultural diversity in the United States flag may also be used to satisfy any other core or degree requirement. A single course may not carry both the global cultures and the cultural diversity in the United States flags simultaneously.

**MAJOR REQUIREMENTS**

**GEOGRAPHY AND THE ENVIRONMENT**

*Major*: Thirty semester hours, including at least eighteen upper-division, of approved coursework in geography and the environment as follows:

1. Geography 301C and 304E.
3. A grade point average of at least 2.00 in the 30 hours of geography coursework required for the major.

**ELECTIVES: REQUIREMENTS AND LIMITATIONS**

In addition to the core curriculum, prescribed work, additional College of Liberal Arts prescribed work, and major requirements, the student must take enough elective coursework to complete the 126 semester hours required for the degree. These may include no more than twelve hours of conference courses and internship courses combined (see page 315 for other restrictions); twelve hours of Bible; nine hours of designated coursework in air force science, military science, or naval science; sixteen hours taken on the pass/fail basis; thirty-six hours in any one subject offered in the College of Liberal Arts or the College of Natural Sciences, unless major requirements state otherwise; and thirty-six hours in courses offered in any other single college or school of the University.

**MINIMUM SCHOLASTIC REQUIREMENTS**

The student must earn a grade point average of at least 2.00 in all courses taken at the University of Texas at Austin (including credit by examination, correspondence, and extension) for which a grade or symbol other than Q, W, X, or CR is recorded. More information about grades and the grade point average is given in General Information.

A grade of at least C- is required in each mathematics and science course specifically required by the degree.

**SPECIAL REQUIREMENTS**

The student must fulfill the University requirements for graduation given on pages 15–16 and the requirements of the College of Liberal Arts given on pages 314-316.