

Certificate Proposal Overview
College of Sciences
Environmental Science Academic Programs
Certificate in Environmental Sustainability

1. Statement of Purpose.

This 15-hour certificate in Environmental Sustainability is designed to meet the needs of prospective students interested in developing knowledge in environmental sustainability. The purpose of this certificate is to provide professionals who already have undergraduate degrees with graduate instruction in environmental sustainability as a means of maintaining and promoting their professional development. According to Daly (1990), environmental sustainability can be defined as

“the rates of renewable resource harvest, pollution creation, and non-renewable resource depletion that can be continued indefinitely.”

More simply, environmental sustainability can be defined as the ability to maintain factors and practices that are valued in the physical environment and that contribute to the quality of the environment on a long-term basis. The certificate program is designed to provide post-baccalaureates with course work in environmental sustainability outside of their undergraduate major. The certificate provides students with a post-baccalaureate educational opportunity that is narrower in scope and shorter in duration than its associated master’s graduate degree program in the Environmental Science Academic Programs.

Educational Goals.

The goal of this certificate is to fill specific gaps in knowledge for environmental professionals who are seeking advanced knowledge and skills in environmental sustainability. The certificate also builds a strong foundation for participants to obtain a master’s degree at a future date. The

coursework will develop interdisciplinary skills that are important for a successful environmental science professional who is looking to become a leader in environmental sustainability.

Successful students

- 1) Will be able to critically analyze science and policy issues of climate change as they relate to sustainability,
- 2) Will be able to explain, summarize, and apply various United States' environmental laws related to sustainability,
- 3) Will be able to be able to explain the ecological and evolutionary dimensions of conservation and restoration as they relate to sustainability,
- 4) Will demonstrate proficiency in teamwork skills needed for environmental science assessment teams,
- 5) Will be able to analyze the importance of sustainability concepts into community planning, transportation, and land use,
- 6) Will demonstrate proficiency in teamwork skills needed for solving environmental sustainability issues.

Link to Existing Programs. The Certificate in Environmental Sustainability will be housed in the Environmental Science Academic Programs Office. Degree-seeking, special graduate or non-degree-seeking students from any discipline at UTSA will be allowed to complete the Certificate in Environmental Sustainability.

2. Statement of Need.

As the concept of "sustainability" grows in popularity throughout the world, an ever-increasing number of environmental jobs emerge. According to Marsha Willard, executive director of the International Society of Sustainability Professionals and CEO of Axis Performance Advisors, the value of a sustainability degree is "increasing as each day passes". There is a demand for employees and leaders who know what sustainability is and understand its complexity, understand how to approach problems and solutions, and know how to work with and draw from different disciplines. Sustainability will continue to be a burgeoning industry with great career potential as resources and energy become more scarce and expensive. Students within the sustainability discipline can develop a breadth of knowledge and experience, acquire skills to integrate various domains of knowledge, and prepare themselves for a variety of careers. Recent interest in sustainability within business and government has created new employment opportunities – in positions like sustainability coordinators, directors, and managers. Students with backgrounds in sustainability may assume positions in industry, consultancy, utilities, regulatory agencies, nonprofits, governmental agencies and nongovernmental organizations.

4. Description of Curriculum.

Requirements for completion include:

Completion of **15 graduate** hours of approved UTSA coursework with a "B" or better in each course.

Required Courses:

ES 5043 Global Change

(3-0) 3 hours credit. Prerequisite: Graduate standing in the program or consent of instructor. Changes in the global distribution of plants and animals and the causes of the changes will be examined. Factors that are apparently coupled to changes in the atmosphere and environmental temperature will be examined. (Formerly EES 5043. Same as CE 6113 and GEO

5043. Credit can be earned for only one of the following: CE 6113, EES 5043, ES 5043, or GEO 5043.)

ES 5133 - Fundamentals of Environmental Law (3-0) 3 hours credit. Prerequisites: Graduate Standing. This course exposes students to basic legal theories relevant to contemporary environmental practice, and provides an introduction to administrative law as well as six federal environmental statutes: the Clean Air Act, Clean Water Act, National Environmental Policy Act, Endangered Species Act, Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

ES 5753 Conservation and Restoration Biology (3-0) 3 hours credit. The class topics will include the nature of the biosphere, threats to its integrity, and ecologically sound responses to these threats. Also included will be the origin and preservation of biotic diversity, how the rich variety of plant and animal life arose, how it has been maintained by natural processes, and how its destruction can be prevented. (Same as BIO 5753. Credit cannot be earned for both BIO 5753 and ES 5753.)

ES 5XX3 - Urban Environmental Planning and Sustainability

This course examines how the concept of sustainable development applies to buildings, cities and urban regions and gives students insight into a variety of contemporary urban planning and green building issues through the sustainability lens. Ways to coordinate goals of environmental, economic, and social equity at different scales of planning are addressed, including the region, the city, the neighborhood, the site, and buildings.

ES 6053 - Renewable Energy (3-0) 3hours credit. Prerequisites: Graduate standing. This course provides an introduction to energy systems and renewable energy resources. It will be a scientific examination of the energy field and an emphasis on alternate energy sources, their technology, application, and how they can lead to a more sustainable future. The class will explore society's present needs and future energy demands, examine conventional energy sources and systems, and then focus on alternate, renewable energy sources and how they can lead to sustainability.

5. **Faculty List.** Because this certificate draws from existing course offerings, five faculty members from the Environmental Science Academic Programs will be appointed to the certificate program. Additional Environmental Science Academic Program faculty will support the program as needed.

The certificate program appointed faculty members are:

Janis K. Bush, Ph.D., Associate Professor (Director, Environmental Science Academic Programs)

Fernando Martinez, Ph. D, Lecturer III (Graduate Advisor of Record)

Karen Engates, Ph.D., Senior Lecturer (Global Change)

Julie Foote, Ph.D, Lecturer III (Conservation and Restoration Biology)

Robert Thompson, JD, Senior Lecturer (Fundamentals of Environmental Law)

David Matiella, M. Arch, Lecturer II (Urban Environmental Planning and Sustainability)

6. Program Administration. The Environmental Sustainability Certificate will be housed in the Environmental Science Academic Program, whose members will support students. The Program Director will be Dr. Janis Bush, the director of the Environmental Science Academic Program. Dr. Fernando Martinez, the Graduate Advisor of Record for the Environmental Science Academic Programs will serve as the Program Advisor. The Environmental Science Academic Program Graduate Committee will be responsible for overseeing the processes related to admissions' decisions. The Program Advisor chairs the Environmental Science Academic Program Graduate Studies committee and committee is composed of at least two faculty members in the Certificate Program. This committee will participate in decision-making about advising, recruitment, scheduling courses, and program policies. Certificates will be awarded upon completion of the 15 approved UTSA hours in the areas of environmental science with a "B" or better in each course.

7. Admissions Requirements. The prerequisites for this program are a bachelor's degree with a current status as a degree-seeking, non-degree seeking, or special status student in a graduate-level school program. The following statement will be added to the next Graduate Catalog:

"Students who are not currently enrolled in a graduate degree program will be required to apply for admission to UTSA as a special graduate student and to

indicate their intent to seek admission into a certificate program. Applicants will be required to meet University admission requirements for *special graduate students*. Once admitted as a special graduate student, the student will contact the Program Advisor and complete a form requesting permission to enter and complete the certificate program. The Program Advisor and the Dean of the College Science will sign the form. A copy of this form will be sent to the Graduate School.”

To maintain enrollment in the certificate program, students should maintain a 3.0 GPA throughout tenure in the program.

8. Projected Enrollments. While the certificate is likely to draw new students to UTSA, it is also likely that UTSA graduates would pursue this certificate. This certificate will increase the student’s marketability in the field for job placement.

Table 1. Projected Admissions and Enrollments

Category	Year 1	Year 2	Year 3	Year 4	Year 5
Admissions	5	7	10	10	10
Enrollments	5	7	10	10	10

9. Budget. There are no additional funds requested in the management of this certificate.

10. Endorsements. Dr. Janis K. Bush has reviewed, accepted, and provided a letter of support for this proposal (Appendix A).

11. Evaluation/Reviews. Evaluation of the certificate program will be conducted annually (see Table 2). Student portfolios will be used for formative and summative assessment. Student progress will be evaluated formatively based on success in the coursework of Certificate classes. Upon completion of each semester of coursework, students will submit portfolios for review of work completed to date. The portfolio will include items demonstrating mastery of coursework and the application of environmental sustainability skills as well as a student self-assessment statement of progress. At the end of their coursework, all students will present their final environmental sustainability project and their portfolio to the Certificate faculty who

will review the project and portfolio using the final review rubric. The summative evaluation will include student GPA of 3.0 or better in the certificate area coursework and a final portfolio (including a culminating project of an environmental sustainability project). We will also include attrition rates and completion rates in the general certificate evaluation.

The final portfolio must include:

1. A self-evaluation statement in the form of a cover letter stating progress and development, summary of activities related to environmental sustainability coursework.
2. Transcripts
3. A written comprehensive environmental sustainability project illustrating competency in environmental sustainability concepts.
4. Final Review Rubric (by Certificate faculty)
5. A current CV or resume.

Outcome	Evaluation Measure
Critically analyze science and policy issues of climate change as they relate to sustainability,	A rubric measuring various dimensions of written communication focusing on content will be used to evaluate a research paper in graduate courses on the role and impact of humans on climate change over time and in the future for a representative sample of students. At least 80% of students will demonstrate a proficiency (3) or higher on a scale of 1-4 (4=Excellent, 1= Poor) on the content rubric dimension.
Explain, summarize, and apply various United States' environmental laws related to sustainability.	A rubric measuring various dimensions of written communication to focusing on content will be used to evaluate a research paper in graduate courses on the application of federal law at the state level to sustainably manage resources for a representative sample of students. At least 80% of students will demonstrate a proficiency (3) or higher on a scale of 1-4 (4=Excellent, 1= Poor) on the content rubric dimension.
Explain the ecological and evolutionary dimensions of conservation and restoration as they relate to sustainability	A rubric measuring various dimensions of written communication to focus on content will be used to evaluate a research paper in graduate courses on the importance of conservation/ restoration ecology in sustainable environments for a representative sample of students. At least 80% of students will demonstrate a proficiency (3) or higher on a scale of 1-4 (4=Excellent, 1= Poor) on the content rubric dimension.
Analyze the importance of sustainability concepts into community planning, transportation, and land use.	A rubric measuring various dimensions of written communication focusing on content will be used to evaluate a research paper in graduate courses on the relationship of the built environment to the natural environment for a representative sample of students. At least 80% of students will demonstrate a proficiency (3) or higher on a scale of 1-4 (4=Excellent, 1= Poor) on the content rubric dimension.
Demonstrate proficiency in teamwork skills needed for solving environmental sustainability issues.	A rubric that measures various criteria of effective teamwork to include facilitating the team process, communicating, timeliness including keeping on task and meeting deadlines, and problem solving to produce a group presentation in graduate courses. At least 80% of students will score a 3 or higher on a scale of 1-4 (4=Excellent, 1= Poor) on each rubric dimension.
Demonstrate proficiency in oral and written communication for an environmental science audience	Rubrics measuring various criteria of written communication to include organization, content, syntax, and oral communication to include organization, delivery, and preparation will be used to evaluate a written self-evaluation statement and oral portfolio defense for certificate – seeking graduate students by the certification review committee. At least 80% of students will demonstrate a proficiency (3) or higher on a scale of 1-4 (4=Excellent, 1= Poor) on each rubric dimension of both the oral and written communication rubrics.