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UNIVERSITY OF NORTH TEXAS
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GREEN PAPER #1

UNIVERSITY OF NORTH TEXAS
SUSTAINABILITY COUNCIL

26 NOVEMBER 2008

“WE MEAN GREEN”

A Powerful Idea.

The University of North Texas, with nearly 35,000 students, offers 99 bachelor's, 104 master's and 49 doctoral degree programs. UNT students, faculty, and staff impact the economy, environment, and society by the way we consume resources. Fossil fuels are among the resources we consume most conspicuously, and the associated emission of greenhouse gases prompted UNT President Gretchen Bataille to sign the American College and University President's Climate Commitment (ACUPCC) in January 2008. The Commitment requires an emissions inventory, the development of a climate action plan to reduce emissions, and the promotion of economic, environmental, and societal sustainability in the university curriculum.

Shortly after signing the Commitment, President Bataille appointed the Sustainability Council composed of faculty, staff, and students to discuss and address terms of the Commitment and to seek routes that UNT may take to become a green, sustainable campus. The Council recommends immediate actions to open an Office of Sustainability, led by a full-time Director of Campus Sustainability Programs, and proposes 28 initiatives in 1) curriculum, 2) research, 3) communication, and 4) administration and operations as outlined in this document, Green Paper #1. The Sustainability Council's 28 recommendations will work to build campus infrastructure and develop programs by engaging students, faculty, and staff in a transformative movement to become a more sustainable community of higher learning. The Council proposes that this transformation begin by including sustainability in the current UNT Strategic Plan. This will promote connections between people and the environment as well as establish sustainability as a core value in the 2013-2018 Strategic Plan.

UNT is a typical large public university charged with the responsibility of creating and disseminating knowledge. In fulfilling this charge, the university has a substantial environmental impact on the north Texas region and beyond. One of the largest environmental concerns today is climate change brought about through the release of carbon dioxide, a waste product produced through the consumption of fossil fuels used for energy. In addition to the carbon dioxide released during the combustion of these fuels, the use of these fuels also creates pollutants that degrade air and water quality locally and regionally. As a large university we have a significant carbon footprint:

- We require significant amounts of energy for the university's basic operations, and most of the energy is fossil fuel dependent.
- We are the single largest employer in Denton County with 7,400 employees commuting to work daily.
- We have a substantial commuter student population (of our 34,750 students, less than 6,000 reside on campus), which typically travels to and from campus multiple times each week.
- We have a national and international presence, and the DFW airport is a convenient launching point for UNT students, staff and faculty who board more than 2,600 university-funded round-trip flights each year, 75% of which are out-of-state or international.
- We are a powerful purchasing organization, which requires small- and large-delivery vehicles to come and go constantly. Many of those deliveries bring office, teaching and research supplies as well as enough food and beverages to prepare approximately 1.8 million meals by food and catering services each year. While some of what is consumed on campus is produced locally, many of the items used on campus have traveled long distances.
- We use significant amounts of energy to construct university buildings and other campus infrastructure, and the off-campus production of building supplies and the transportation of those supplies to campus expends a great deal of additional energy.

The university's environmental footprint extends beyond energy usage. UNT consumes a significant amount of local resources and has a significant impact on air, land and water quality in the region:

- We are a major consumer of Denton's drinking water, a major contributor to Denton's wastewater treatment plant, and a major user of landfill space.
- We consume and dispose of liquid or solid waste that can contain toxic materials (e.g., compounds found in electronic equipment, fluorescent lamps, batteries, as well as supplies used by facilities for maintenance), which can contaminate surface water and groundwater if not disposed of properly.
- We use toxic chemicals and pesticides in maintaining the campus and its grounds.
- We use many dangerous and toxic compounds in our research, which further contribute to the difficulties of proper disposal.
- We have constructed campus buildings with materials that create air and water pollution in the area where they were produced.
- We have demolished or renovated buildings, which may contain materials (e.g., asbestos) that create an additional negative environmental impact if not treated properly.

UNT has a very big environmental footprint indeed. However, UNT also works hard to reduce that footprint.

- We initiated an energy savings performance contract 10 years ago to reduce energy use on campus, which has resulted in an annual 15% reduction in greenhouse gas emissions from campus operations.
- We initiated our recycling program about the same time and divert some 40,000 cubic feet of refuse from local landfills each year, while collecting 13,000 plastic bottles and 300 pounds of aluminum cans each week.
- We have not only been collecting paper for recycling, but also have been using recycled paper, doing our part to close the recycling loop.
- We have replaced many petroleum-based products with water-based products.
- We use many green cleaning products.
- We have begun using electric vehicles for cross-campus travel.
- We doubled our bike rack capacity to encourage bicycles rather than cars for travel to and from campus.
- We built a green building (EESAT) even before the U.S. Green Building Council developed its Leadership in Energy and Environmental Design (LEED) program.
- We recently made the commitment to construct all new buildings to at least LEED Silver certification, and a major research building—one of the more difficult types of building to make green—is now being constructed under this certification.

UNT also has a long tradition of environmental research, education and outreach programs.

- We started a water quality research program nearly 40 years ago that has led to nationally known graduate degree programs in environmental science.
- We have a highly recognized environmental ethics program, which was started nearly 20 years ago.
- We are home to the academic journal *Sustainable Communities Review*, which began publication 10 years ago.
- We have been at the forefront of installing alternative energy programs (e.g., solar panels and micro wind turbines) in poor rural areas such as Zacatecas and San Martin, Mexico, where energy is in short supply.
- We have the Elm Fork Education Center, an outreach program initiated 10 years ago that brings 15,000 school-age children to campus each year to learn about the environment.

This year, President Bataille formed the UNT Sustainability Council, marking the beginning of a new era of the “greening” of UNT.

The most significant recent development in UNT’s commitment toward reducing our environmental impact was the signing of the American College and University Presidents Climate Commitment (ACUPCC) to move UNT to a carbon neutral campus. UNT was the first large university in Texas to commit to this action. This commitment will dramatically alter how we commit our resources and the way we do business, and prompted President Bataille’s formation of the Sustainability Council in February 2008.

SUSTAINABILITY COUNCIL CHARGES

The Sustainability Council was presented the following three charges by President Bataille:

1. Inventory what UNT has already done to move towards sustainability.
2. Determine if there are national norms or measures of sustainability that could be useful to the campus.
3. Make recommendations for sustainability policies and practices supportive of UNT's move to become a "green" campus.

The Sustainability Council decided we needed to develop a definition of sustainability to meet the president's three charges. After researching, reviewing, refining, and thoughtful discourse we selected as our definition:

SUSTAINABILITY	The thoughtful use of natural resources to ensure the future health of the earth's communities.
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This definition allows us to inventory activities that meet the definition, to determine national norms and measures of these types of activities, and to make recommendations that support UNT's thoughtful use of our natural resources. Our definition of sustainability allows us to create positive solutions, to balance social, economic and environmental impacts of our decisions, and to become responsible stewards of the earth's natural resources for future generations.

FIRST CHARGE

The first charge of inventorying sustainable activities was achieved through a three-prong approach.

- We gathered information from Council members about activities they were aware of.
- We asked UNT's associate deans to provide insight into activities in their colleges.
- We asked specifically targeted faculty to provide additional information.

Attachment 1 of this report is an inventory of activities underway at UNT that we believe meet our definition of sustainability. The inventory is not complete, but it is extensive and demonstrates that sustainability-related research and curriculum can be found across campus. It also shows that UNT operations are currently making significant changes to become more sustainable.

SECOND CHARGE

The second charge of determining national norms for sustainability to use as standards was completed by a thorough internet search of systems used to rate or rank academic institutions. The Sustainable Endowments Institute issues the College Sustainability Report Card in which sustainability profiles are created for the top 300 universities with the largest endowments. The

report card ranks universities by assigning them a letter grade. Although UNT doesn't meet the endowment requirements for this rating system, other universities in Texas (e.g., UT Dallas, Texas Tech, and University of Houston) are listed, and offer important points for comparison.

The rating system that is likely to become the standard used by universities is the Association for the Advancement of Sustainability in Higher Education's *Sustainability Tracking, Assessment and Rating System* (STARS). It is currently the most detailed and extensive rating system and is being developed through two pilot phases in which a sample of 90 universities—of different sizes awarding a variety of degrees—use and evaluate the system. It is the only rating system being developed with input and feedback from universities. Attachment 2 is a list of the categories currently being used and evaluated in the second and final pilot phase, which will be completed in December 2008. The first version of STARS for general use will be rolled out in Fall 2009.

THIRD CHARGE

The third charge for the Sustainability Council was to recommend policies and practices that will help UNT become a green campus. The Sustainability Council proposes two strategic goals — one short-range and one mid-range goal. These two goals are followed by a series of 28 policy and practice recommendations, which will help achieve these goals.

<p>SHORT-RANGE GOAL (ONE YEAR)</p>	<p>The strategic plan, academic plan and master plan will contain a central theme related to environmental sustainability.</p>
<p>MID-RANGE GOAL (FIVE YEARS)</p>	<p>UNT will be nationally recognized as a leading green university.</p>

In recent decades it has become increasingly clear that considerable behavioral changes will be necessary to maintain a reasonable global standard of living. We believe these goals are important because universities occupy a unique position in society. Through both research and teaching, universities shape the intellectual discourse that will largely determine the path of our behavioral changes. In research, universities are not only responsible for understanding the ecological impact of human activity and finding technical solutions to these environmental problems, but they are also the places to develop, analyze and debate the economic, political, social, and philosophical consequences of policies instituted to create a more sustainable society. In teaching, universities are shaping the next generation of leaders and experts who will largely be responsible for creating a more sustainable society that continues to thrive and enrich all the world's populations.

To undertake this challenge and be successful, graduating students must understand the pertinent social and scientific issues and be able to use them intelligently and wisely. But we must also go beyond teaching and research. Given this crucial role that universities have in society, it

is incumbent upon UNT to become a leader in the sustainability movement. In doing so, UNT will itself become a laboratory for sustainable technologies and policies that will be necessary to meet future environmental challenges. To best serve society, sustainability must permeate not only teaching and research, but also the operations of the university itself. These goals are a first step in making UNT the institution that the State of Texas needs it to be.

Both our short- and mid-range goals can be achieved through various mechanisms. The primary approach we propose is a policy that requires all major actions considered by UNT be considered through the filter of the following question: “*What are the present and future benefits and environmental impacts associated with this action?*” Assuring that the UNT community considers sustainability in all major decisions will also require an action-forcing mechanism. Therefore, we recommend all major proposed projects, plans, policies and programs with potential environmental impacts be accompanied by a sustainability statement that document the consideration of future benefits and costs of the proposed action. Controversial sustainability statements, or those whose current and future benefits and costs are unclear, should be reviewed by the Sustainability Council for recommendation to the appropriate Vice President or, if necessary, the President of UNT.

The STARS system can help UNT compare itself to other institutions by measuring various national norms and metrics. More importantly, however, is being known as a university that teaches sustainability to our students—and leads by example—as we continually consider the present and future environmental impacts of all major decisions we make. To move towards this type of decision making, and achieving our goal of national recognition, a series of specific actions and/or policy initiatives (some of which have been adapted from STARS and ACUPCC specifications) are required. The recommendations can be categorized into:

- immediate actions;
- curricular and educational initiatives (*related to UNT’s Strategic Plan’s Goal 1: To promote excellence in student-centered education*);
- research initiatives (*related to Strategic Goal 2: To increase research, scholarship and creative activities*);
- communication initiatives (*related to Strategic Goal 3: To enhance institutional reputation, community engagement, and advancement*);
- operational initiatives (*related to Strategic Goal 4: To improve institutional effectiveness*), and;
- administrative and financial initiatives (*related to Strategic Goal 4*).

IMMEDIATE ACTIONS

1. Open an Office of Sustainability, headed by a Director of Campus Sustainability Programs. The Director will carry the responsibility of developing UNT's *Sustainability Plan*, including the requirements for sustainability statements, and in turn achieving the goal of national recognition for our green efforts. This office will also be responsible for developing internal sustainability recognition programs that encourage and reward outstanding sustainable initiatives.
2. Complete a greenhouse gas emissions inventory (as required by ACUPCC) for UNT including our campus operations, vehicle trips by faculty, staff and students as well as air travel. This will be the responsibility of the Office of Sustainability.
3. Prepare a *Climate Action Plan* based on the emissions inventory, which meets the requirements of the ACUPCC, including achieving a carbon neutral campus. The Office of Sustainability will complete this plan by January 2010.
4. Move the attached tree policy (Attachment 3) through UNT's policy approval system. The Office of Sustainability will be responsible for assisting the Tree Advisory Committee with the development of the Master Tree Plan and educating the campus community about the benefits of UNT's heritage and valuable trees.

CURRICULAR/EDUCATION INITIATIVES (related to Strategic Plan Goal #1)

1. The Office of Sustainability will work with the Office of Provost and Vice President for Academic Affairs to require all colleges and schools, and as many academic departments as appropriate, to develop undergraduate coursework that is focused and/or related to sustainability, including appropriate incentives for developing these courses. Students should be able to earn a degree in Environmental Sustainability based on UNT's inventory of new and existing courses.
2. The Office of Sustainability will work with the Faculty Senate to infuse sustainability concepts throughout the core curriculum to assure that at least 5% of each undergraduate student's semester credit hours contain sustainability focused or related courses, and that the core curriculum contains a sustainability requirement.
3. The Office of Sustainability will work with the Toulouse School of Graduate Studies to develop an interdisciplinary graduate program that leads to master's and doctoral degrees in sustainability. Courses should be open to any UNT graduate student interested in a sustainability minor.
4. The Office of Sustainability will work with the Office of the Provost and Vice President for Academic Affairs, the Office of Classroom Management and the Center for Learning Enhancement, Assessment and Redesign to encourage colleges and schools to maximize the number of online, blended traditional/online courses, and one-day-per-week courses with the intent of reducing the number of commuter days experienced at UNT.

RESEARCH INITIATIVES (related to Strategic Plan Goal #2)

1. The Office of Sustainability will work with the Office of the Vice President for Research to develop programs to encourage internally and externally funded research in sustainability, and simultaneously work with the Office of the Provost and Vice President for Academic Affairs to assure that interdisciplinary research is treated the same as discipline-specific research for promotion and tenure decisions.
2. The Office of Sustainability will mark a portion of its budget for supporting faculty-led, student-driven sustainability projects focusing on UNT's sustainability needs. These projects should be outcome based and provide information, ideas or recommendations for improving UNT's sustainability.

COMMUNICATION INITIATIVES (related to Strategic Plan Goal #3)

1. The Office of Sustainability will work to build an infrastructure to encourage faculty, staff and student participation in community service that promotes sustainability.
2. The Office of Sustainability will develop programs that prominently include sustainability concepts in new student, new staff and new faculty orientations.
3. The Office of Sustainability will work with the Office of Student Development and other programs such as the Study Abroad Program, Adult Education, and non-academic certification programs to foster student engagement and instill sustainability concepts throughout campus. Emphasis will be given to encourage engagement beyond the boundaries of the UNT campus where our students and alumni make their own differences in the world.
4. The Office of Sustainability will work with the Office of the Vice President for University Relations and Communication Management to build relationships with the Denton community, including both the private and the public sector, to assure that the work of the sustainability initiatives are known both on campus and off.

OPERATIONAL INITIATIVES (related to Strategic Plan Goal #4)

1. The Office of Sustainability will work with the Office of Facilities Management to assure all new construction and renovations are LEED Silver certified, exceeding this certification whenever feasible.
2. The Office of Sustainability will work with Facilities and Business Services to examine all existing buildings and achieve LEED-EB Silver rating for at least 60% of existing square footage constructed prior to 2009.
3. The Office of Sustainability will work with Facilities and Business Services to reduce potable water consumption, while at the same time encouraging the use of reusable drinking water bottles over the use of canned and plastic bottled water or sodas.
4. The Office of Sustainability will work with Facilities and Business Services to train building maintenance crews in sustainable cleaning practices and products.
5. The Office of Sustainability will work with the Office of Dining Services to maximize the use of locally grown, organic and fair trade foods and beverages used for all meals served on campus.
6. The Office of Sustainability will work with Facilities and Business Services to ensure that UNT's campus is maintained under the same standards as USDA imposes for organic crop production.
7. The Office of Sustainability will work with the Facilities and Business Services to ensure that UNT's campus does not use potable water for irrigation purposes.
8. The Office of Sustainability will work with Facilities and Business Services to improve reduction, reuse and recycling activities and ensure that UNT moves to a zero landfill waste campus for solid, construction, electronic and hazardous waste.
9. The Office of Sustainability will work to ensure UNT's fleet is carbon neutral (emits zero pounds of carbon dioxide equivalent per passenger mile traveled) and the UNT population maximizes clean, energy-saving modes of transportation.
10. The Office of Sustainability will work with the Athletic Department to require independent verification that UNT logo apparel products are produced under fair conditions.

ADMINISTRATIVE AND FINANCIAL INITIATIVES (related to Strategic Plan Goal #4)

1. The Office of Sustainability will work with the Office of the Provost and Vice President for Academic Affairs to insert a fourth "key theme" in the UNT 2008-2013 Strategic Plan that brings attention to sustainability:
 - Diversity – connections with different viewpoints and backgrounds
 - Internationalization – connections across the world
 - Collaboration – connections with the academic community on and off campus
 - Sustainability – *connections between people and the environment*

In the next Five-Year Strategic Plan, we recommend that sustainability be elevated to a strategic goal.

2. The Office of Sustainability will work the with Office of the Vice President for Diversity and Equity to maintain a diverse UNT community with support for underrepresented groups, assuring that UNT maintains affordability and access to our programs.
3. The Office of Sustainability will work with the Office of the Vice President for Finance to ensure UNT's endowment maintains transparency (with input from faculty, staff and students) on investment recommendations to advance sustainability investments, and to ensure that UNT advocates sustainability to the companies in which UNT holds investments.
4. The Office of Sustainability will work with the Office of Human Resources to assure that there is sustainable compensation for faculty, staff and student employees, with benefits including adequate parental leave and spousal accommodation policies.

Respectfully submitted by the UNT Sustainability Council, November 24, 2008

For the Council:

Sam Atkinson, Chair

UNT SUSTAINABILITY COUNCIL

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ATTACHMENT 1 Sustainability Activities at UNT

ATTACHMENT 2 STARS Categories of Sustainability Ratings

ATTACHMENT 3 UNT Tree Policy

ATTACHMENT 1
Sustainability Activities at UNT

COLLEGE	DEPARTMENT	DESCRIPTION
CAS	BIOLOGY	<ul style="list-style-type: none"> • BIOL 1132. Environmental Science. Interdisciplinary approach to understanding basic concepts in environmental science including critical scientific thought, biodiversity, resource management, pollution, global climate change, resource consumption and population growth. Emphasis on how these concepts affect and are affected by human society. • BIOL 3160. Biological Resource Conservation and Management. Principles and values relating to natural biological resources; ecological concepts applied to resource management and protection of aquatic organisms, rangelands, forests and wildlife. • BIOL 4100/5100. Introduction to Environmental Impact Assessment. Principles and practices of preparing environmental impact assessments and statements. Addresses how to understand the effects that projects, plans and policies have on the environment and the impact those effects have on specific resources, ecosystems and human communities. Methods for identifying impacts, describing the affected environment, predicting and assessing impacts and selecting the proposed action from a group of alternatives for meeting specified needs are examined. (Atkinson) • BIOL 4380/5380. Fundamental Aquatic Toxicology. Theory and methodologies used by scientists, regulatory agencies and industry to measure the impact of man's activities on freshwater aquatic ecosystems. The course has its foundations in history, but concentrates on current methodologies and theories • BIOL 4440/5440. Stream Ecology. Ecological principles of how stream dynamics influence the biological and hydrologic patterns and processes occurring in stream ecosystems. Laboratory studies designed to teach techniques and to test hypotheses related to environmental assessment. Prerequisite(s): 3 hours of ecology. (Same as BIOL 4440.) • BIOL 4005/5040. Contemporary Topics in Environmental Science and Ecology: Sediment Toxicology • BIOL 4005/5040. Contemporary Topics in Environmental Science and Ecology: Molecular Toxicology • BIOL 4005/5040. Contemporary Topics in Environmental Science and Ecology: General Toxicology • BIOL 4005/5040. Contemporary Topics in Environmental Science and Ecology: Stress Ecology • BIOL 5120 Environmental Contaminants. Presents a scientific overview of environmental contaminants, their occurrence, sources and impact on humans and the environment • BIOL 5130. Foundations of Environmental Science • BIOL 5150 Pharmacology • BIOL 5650. Environmental Science Field Course. Advanced field methods and approaches for analysis of the physical, chemical and ecological aspects of aquatic, terrestrial and estuarine ecosystems are covered. On a rotating basis, the field course focuses on alpine lakes, deserts and estuaries. • BIOL 5880. Environmental Sciences Seminar Series. 1 hour. A weekly seminar series covering a broad range of environmental research topics. Invited speakers are prominent local, regional or national researchers. • BIOL 5100. Environmental Impact Assessment. This course addresses the principles and practices of preparing environmental impact assessments and statements. The course addresses how to understand the effects that projects, plans and policies have on the environment and the impact those effects have on specific resources, ecosystems and human communities. • BIOL 6341. Advanced Environmental Impact Assessment. Advanced topics in preparing environmental impact assessments and statements by examining deficiencies and inadequacies of environmental assessments and impact statements (i.e., was the analysis adequate), as defined by U.S. District, Appeals and Supreme Court decisions • BIOL 6390. Techniques in Environmental Analysis. Theory and application of advanced analytical chemistry techniques for metals and organics in environmental and biological samples. Introduces methods for trace metals analysis and identification, and organics separation and identification techniques. • BIOL 6400. Ecological Risk Assessment. A detailed treatment of aquatic and terrestrial methods and procedures used to assess the ecological hazard of chemicals in the environment. Emphasizes quantitative methods in testing site assessment, monitoring procedures, regulatory

COLLEGE	DEPARTMENT	DESCRIPTION
		requirements and field and laboratory techniques useful to assess damage to aquatic, terrestrial and avian resources.
		MS/PhD in Environmental Science Professional Science Masters Degree in Environmental Science
CAS	ECONOMICS	ECON 4440. Economics of Natural Resources and Environment. Recently a significant number of environmental problems have received considerable attention from the press: Acid rain, the green house effect, the deterioration of the ozone layer, groundwater pollution, habitat loss and over-harvesting of fish. These problems have convinced many people that mankind is incapable of living in harmony with the environment. We shall use as our organizing principle of the course the following questions: Can our economic and political institutions produce a sustainable growth path in the presence of a finite environment? What are the benefits and costs of our actions? What are the most efficient solutions to our problems? (Nieswiadomy)
CAS	ENGLISH	<ul style="list-style-type: none"> ENGL 3160 Introduction to Creative Non-Fiction. Class focuses on nature writing. Fall 2007 class focused on John Graves' <i>Goodbye to a River</i>, recreating the river trip Graves wrote about in the book, and combined nature writing, ecology, and environmental science. The course was cross-listed with BIOL 5040 and was co-taught by David Taylor (ENGL) and Jim Kennedy (BIOL).
CAS	GEOGRAPHY	<ul style="list-style-type: none"> GEOG 1170: Culture, Environment and Society: Studies human impact on the environment GEOG 4400: Intro Remote Sensing: Satellites to image earth; gives a broader perspective of the impacts on earth GEOG 3010: Economic geography. Examines recycling and reuse of raw materials within industrial production systems. GEOG 4420: Conservation: Encourages an awareness of the need for wise use and proper management of natural resources GEOG 4500/5500: Intro to GIS: Teaches quantitative mapping techniques to inventory natural resources and their impact over time GEOG 4980/5120: Human Interactions with the Environment, Mexico. Investigates the impacts on the environment from the growing of decorative flowers for Mexican, U.S. and European markets through surface and groundwater sampling for pesticide residue, stream ecology studies, environmental toxicology, eco-tourism, philosophy, culture, and socio-economic factors of rural life. GEOG 4980/5120: Human Interactions with the Environment, Nepal. Investigates human and environment relations in Nepal, and provides hands-on experience on endangered wildlife management and community forest practices, and applying models to study grassland and floodplain hydrology. GEOG 5130: Seminar in Human Geography: Industrial Ecology. Examines recycling and reuse of raw materials within industrial production systems. (Lyons) GEOG 5130: Seminar in Human Geography: Urban Geography: Emphasis on cities and building cities to optimize use of resources (ex. Transportation efficiencies, travel times) (Lyons) GEOL 4650: Environmental Geology: Principles of sustainability and wise use of geology resources (Hudak) GEOL 4850: Groundwater Hydrology: Deals with human impacts on sub-surface water and cleaning polluted aquifers (Hudak) Applied Paleozoology: course focuses on long term ecological changes that are caused by modern (short term) impacts.(Wolverton) ARCH 3650: Origins of Civilization: Examines the rise and fall of ancient civilizations, focusing in particular on the environmental consequences of and effects on civilizations. <p>MS in Applied Geography</p> <ul style="list-style-type: none"> Track in Urban Environmental Management – As the environmental responsibilities of local governments grow in response to increased environmental legislation, municipal departments, permitting/oversight agencies, and contracting, environmental engineers need informed, capable, and effective individuals to liaison between them and city managers. The objective of this track is to train students to manage the planning and implementation of both compliance and ethical strategies for sustaining the urban environment. Track in Water Resources Management – Many parts of the world are facing significant water shortage and pollution problems. These problems will likely escalate as populations grow throughout the 21st century. This track under the Masters of Science in Applied Geography

COLLEGE	DEPARTMENT	DESCRIPTION
		(MSAG) enables students to structure their degree plans around scientific, technical, and political aspects of water resources management. The track meets all existing requirements of the MSAG (including courses in research design, quantitative techniques, and a cognate field). Students completing this track may find employment with government research and regulatory agencies, municipalities, planning organizations, water supply districts, or environmental consulting firms.
CAS	HONORS COLLEGE	<ul style="list-style-type: none"> • HNRS 4000 Utopia/Dystopia: Visions and Critiques of Society (David Taylor) • HNRS 4000 Texas Environmental Issues in Literature (David Taylor)
CAS	POLITICAL SCIENCE	PSCI 4500. Leadership Capstone Seminar. Main focus of the class is the development of policy proposal(s) for the City of Denton on one of the following: tree coverage policy, the use of bottled water, or the use of plug-in hybrid cars. The students will decide which project area to focus on during the first class session. At the end of the semester students will present their policy proposals to the planning committee of the Denton City Council. Students will also hear from state and local leaders about the importance of leadership and community involvement. I have been working with City Council member Pete Kamp and Ken Banks, Denton Manager of Environmental Quality (and a UNT alum). (Meernik)
CAS	RTVF	Melinda Levin – Co-teaching the Emerald Eagle Study Abroad class in Thailand on Environmental and Sustainable Development in Globalizing World
CAS	PHILOSOPHY	<ul style="list-style-type: none"> • PHIL 2500. Introduction to Contemporary Environmental Issues. Explores ethical, ecological and policy dimensions of such international environmental issues as atmospheric and water pollution, global climate change, care of agricultural lands, water scarcity, overharvest of renewable resources, loss of biodiversity and world population growth. Environmental problems will be related to other social and ethical concerns. Satisfies the Humanities requirement of the University Core Curriculum. • PHIL 3575. Judaic Religion and Philosophy. The subject-matter of this course is Judaism as found both in the Hebrew Bible (or “Old Testament”) and in post-biblical Jewish life and thought. In the first half of this course, we look at how a number of our Jewish contemporaries are led into larger questions while seeking to defend Judaism against the widespread opinion that the Bible (notably Genesis 1:26-28) is somehow the cause of our current environmental crisis. . . . • PHIL 4700. Environmental Ethics. An examination of basic positions in the field of environmental ethics with emphasis on legal and moral rights for nature, animal liberations and Western philosophical and religious traditions. Prerequisite(s): one previous course in philosophy or consent of department. • PHIL 5450. Seminar in the Philosophy of Ecology. Traces the evolution of ecology from its roots in 19th-century natural history through general ecology, restoration ecology, human ecology and mathematical ecology. Also explores the sociocultural contexts in which ecology emerged and now exists, including the so-called second scientific revolution and the two-culture split. • PHIL 5451. Environmental Ethics. An examination of basic positions in the field of environmental ethics with emphasis on legal and moral rights for nature, animal liberation and Western philosophical and religious traditions.
CAS	INTERNATIONAL STUDIES PROGRAM	<ul style="list-style-type: none"> • BA in International Studies, emphasis on International Development – Students are required to take 12 hours related to environment-related social studies classes. • In the process of drafting a Master Degree in International Studies. One of the areas of specialization is International Development which focuses upon global environmental issues.
CPACS	ANTHROPOLOGY	<ul style="list-style-type: none"> • MA in Applied Anthropology with a specialty in Environmental and Ecological Anthropology - This specialization includes community-based conservation of natural and cultural resources, cultural landscapes/seascapes, indigenous peoples and protected areas, traditional ecological knowledge, human ecology, sustainable development, ethnoecology, political ecology, environmental justice, world views concerning the environment, and globalization and environmental policy.
CPACS	CENTER FOR PUBLIC SERVICE	COMS 4610. Topics in Community Service: Environment and Society – Dallas / Denton Campuses – Spring, Fall and Summer II, 15-25 students per class. Started in 2004. Taught by Mr Iftekhar Amin and Dr Ingman.

COLLEGE	DEPARTMENT	DESCRIPTION
CoBA	ACCOUNTING	<ul style="list-style-type: none"> • ACCT 5150. Development of Accounting Thought. The theory of accounting as it has developed in the economy of the United States. Includes these components of sustainability. • ACCT 5250. Strategic Cost Management. Examines the role and scope of the strategic cost of management accounting within organizations, as well as new cost management tools that provide organizations with information for decision making and control in an international marketplace. Environmental issues broader than just reporting are discussed.
CoBA	MANAGEMENT	<ul style="list-style-type: none"> • MGMT 3880. Business Ethics and Corporate Responsibility. A study of ethical behaviors crucial to personal and corporate success in organizations. Has a unit on the Corporation and the Environment in which covers with how organizations deal with environmental issues. • MGMT 4180. Workplace, Health and Safety. Problems of occupational safety and health (OSHA) workers' compensation, unemployment compensation, industrial security and environmental risk management • MGMT 5710. Management Strategies for Public Issues. Public issues confronting business leaders stemming from profound changes in societal expectations and demands as manifested in political forums and government action. In the last module of the class, students work on a group "social audit" project for all the stakeholder groups to which corporations are held responsible. The environment is considered one of those stakeholders, and therefore their investigation of their company's performance includes an assessment of how progressive their environmental and sustainability programs are. Students must evaluate both the corporation's commitment to the environment and their commitment to sustainable development.
CoBA	CENTER FOR DECISION INFORMATION AND TECHNOLOGIES	<p>CDIT Seminar Talk: IT Sustainability: Issues and Implications for Environmental & Business Responsibility - To raise awareness about both the importance of and the possibilities associated with sustainability ('greening') for IT and to help understand how 'green' can fit with corporate goals and the company's bottom line.</p>
COEng	COMPUTER SCIENCE	<ul style="list-style-type: none"> • CSCE 4910. Computer Engineering Design I. 3 hours. First course in the senior capstone design sequence. Focus is the application of techniques to the design of electronic systems that have digital hardware and software components. Students apply the theory acquired from numerous engineering courses to solve real-world design problems. The design will consider realistic constraints including economic, environmental, sustainability, manufacturability, ethical, social, safety. • CSCE 4915. Computer Engineering Design II. 3 hours. Second course in the senior capstone design sequence. Focus is the application of techniques to the design of electronic systems that have digital hardware and software components. Students apply the theory acquired from numerous engineering courses to solve real-world design problems. The design will consider realistic constraints including economic, environmental, sustainability, manufacturability, ethical, social, safety.
COEd	KINESIOLOGY	<ul style="list-style-type: none"> • HLTH 4350. Environmental Community Health. The nature and complexity of environmental health issues including specific health problems associated with environmental health. The role of the health educator in an environmental health program. • RECR 2550. Leisure: Human Diversity and the Environment. Examines how different cultures express their leisure lifestyles, especially in relation to their environmental resources and how we in the US can enjoy our leisure without destroying our world. Covers eco- and responsible travel, recycling, composting, reuse of materials, safer lawn care and gardening, alternative transportation, Leave No Trace outdoor practices. One activity has students doing an eco-footprint exercise and analyzing their own lives and where they could lessen their impact. (Hodges) • RECR 3050. Programming in Recreation, Parks and Leisure Services. Fundamentals of program planning using techniques of identifying and analyzing program activity areas; content includes program development and application with a variety of population groups and representative leisure service agencies, examines sustainable operation and development strategies. (Walker) • RECR 4180/5060. Facilities. Looks at park development, use and maintenance. Examines eco-friendly products in park development and maintenance. A community service project is part of the curriculum. • RECR 4200. Commercial Recreation. Study of the nature and function of recreation in commercial recreation settings with an eye toward sustainable operation and development

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		strategies. Survey of the development and management of commercial goods and services offered in the leisure market. (Walker)
CPACS	PUBLIC ADMINISTRATION	<ul style="list-style-type: none"> • EADP 4040. International Disasters. Exploration of issues pertinent to international disasters, including the susceptibility of poor countries to natural disasters, the nature of complex emergencies, and the actors involved in humanitarian activity across national borders. Special attention is given to the social, political and economic barriers that perpetuate the vicious cycle of vulnerability as well as the need for long term solutions that promote beneficent forms of development. (McEntire) • EADP 4080. Capstone Course in Emergency Management. Synthesis of emergency and disaster management concepts and perspectives. Case studies of disasters are emphasized to provide real-world examples of applied principles. Discussion of current theoretical approaches and future trends in the field. Topics include sustainable development, resistance, resilience and vulnerability. (McEntire)
CVAD	DESIGN	<ul style="list-style-type: none"> • ART 4070/5730. London Trash: Green Design and Post-Industrial Art. Summer study abroad program; 8 graduates and 21 undergraduates who lived in London to investigate relationships of post-industrial art, consumer culture, the environment and sustainability. Dr. Way collaborated with Assistant Professor of Interior Design, Johnnie Stark. They related concepts, practices and histories of green design, ecology, and environmentalism to art, visual culture and the built environment of the post-industrial era, with comparisons between England and the United States. London's post-industrial art in public settings and museums, along with its botanical gardens, parks, and varied historical and contemporary examples of land use and types of social housing, along with its dynamic, international population and history, made it an exemplary location. The theme of trash served as a means to open for consideration topics ranging from green design, histories of environmental movements, ethnic and class attitudes towards the production, use and re-use of space and things, to theories and technologies of sustainable design, urban studies and social histories of architecture, and histories, theories and practices of consumerism, psycho-politics of hoarding, collecting, and assemblage and installation, junk and other forms of art and culture. <p>Green/Sustainable design is imbedded in the Interior Design curriculum beginning in the freshman year and is included in all subsequent courses. This knowledge is required by our accrediting body and supported by our individual faculty. The ID faculty has taught two Study Abroad classes in the UK on this subject, using some of their varied solutions as examples to support course content (Professor Johnnie Stark, 2008, Cynthia Mohr 2006). The Fashion Design program has implemented a re-cycled clothing project for the last two years (Janie Stidham).</p>
SMHM		<ul style="list-style-type: none"> • SMHM 2800. Foundations of International Travel and Tourism. Travel and tourism examined from global, industry and developmental perspectives. Topics include historical, contemporary and future effects of travel and tourism as related to social, economic, cultural and environmental issues.
Student Organization	GEOGRAPHY CLUB	Actively involved in green activities such as Earth Day, litter cleanup in Denton and on campus
Student Organization	NORTH TEXAS ENERGY AND ENVIRONMENT CLUB	Promote events and activities to increase university education in energy and environmental sustainability such as Photosynthesis environmental photography competition, the Discover the Power of Green 2-day energy and environment forum, and Earth Day activities.
CLEAR		Learning Enhancement Grants – Proposals for courses on sustainability or contribute to UNT's Sustainability Initiative are given priority.

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CAS	INSTITUTE OF APPLIED SCIENCES	<p>The Mission of the IAS is to foster, facilitate and conduct science-based interdisciplinary environmental research that seeks to understand how human actions impact the environment, and to use that knowledge to suggest scientific, engineering, policy and/or educational solutions to environmental problems by:</p> <ul style="list-style-type: none"> • conducting outstanding traditional and interdisciplinary research to provide basic scientific knowledge and to address contemporary environmental issues at local, state, regional, national and international levels; • developing consistent and substantial extramural support from government and private sectors for our research and educational programs; • providing outstanding training opportunities in research and problem-solving for our graduate students that prepare them for careers in academia, governmental agencies, industry, and public health profession; and • providing outstanding basic and advanced courses of study for our undergraduate students that prepare them for graduate and professional schools and careers within the environmental sciences and become more appreciative citizens regardless of their careers. <p>Sam Atkinson</p> <ul style="list-style-type: none"> • research interests revolve around understanding the capabilities and limitations of current and future satellite remote sensing systems to examine regional scale environmental questions. • develops models of the relationship between watershed characteristics and surface water quality. • provides environmental analyses for the computational epidemiological studies of the movement of infectious disease across landscapes. <p>Duane Huggett</p> <ul style="list-style-type: none"> • Is an environmental toxicologist who studies the fate and effects of chemical and non-chemical stressors on ecological and human health. • Researches the bioconcentration and bioaccumulation of contaminants in aquatic organisms, endocrine disruption, pharmaceuticals in the environment and eco-pharmacology. • Also investigating the neurotoxicity of environmental contaminants in sensitive populations, and the metabolism and immune response of tobacco related products. <p>Jeff Johnson</p> <ul style="list-style-type: none"> • Applies current phylogenetic and population genetic methods to identify evolutionary relationships among taxa or populations and inventorying biodiversity to maintain viable populations and help facilitate in species conservation. • Current research primarily addresses conservation issues related to grouse (Family: Phasianidae) and birds of prey (Order: Falconiformes). • Works directly with both government and nonprofit organizations to help incorporate current genetic methods into active conservation efforts. <p>Tom La Point</p> <ul style="list-style-type: none"> • Primary research and teaching interests include contaminant effects on freshwater aquatic communities, specifically in how metals and organic contaminants affect benthic population dynamics and freshwater fisheries. My students and I focus on sediments and sediment-associated chemicals. • A current project is funded by the USEPA-funded to study the consequences of urbanization of the upper Trinity River, specifically looking at water and sediment chemistry, as well as the consequences for benthic invertebrates living in the watershed. This project also has a large public outreach component, one which strives to educate the public on water and watershed issues in North Texas. • Another project uses 12 artificial streams, located at the City of Denton, TX, Wastewater Treatment Facility to develop a close study of how benthic community dynamics are altered in the face of controlled dosing of a progestin (reproductive hormone), commonly found downstream from municipal treatment plants. The results from the artificial streams will be compared to those from the water treatment plant to understand benthic community responses in Pecan Creek, the receiving stream for the City of Denton Wastewater Treatment Facility. <p>Aaron Roberts</p> <ul style="list-style-type: none"> • Conducts aquatic toxicology research that examines sustainable management of aquatic resources. The ultimate goal of his work is to provide managers with the best possible data

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		<p>so that sound decisions can be made for the conservation and protection of aquatic ecosystems.</p> <ul style="list-style-type: none"> • Studying the effects of mercury on fish species in state and national parks, • Also investigating the environmental implications of emerging nanotechnologies, • And researching the potential impacts of changing climate and environmental conditions on alpine lakes. <p>Kevin Stevens</p> <ul style="list-style-type: none"> • Research in the Wetland Plant Ecology Laboratory focuses on understanding our impacts on wetland plant communities and examining the capacity of wetlands and wetland plants to mediate the often adverse effects of increasing urbanization. Current projects include: • Monitoring plant community trajectories in the Greenbelt Corridor following a prolonged flood event (with support from Texas Parks and Wildlife and NSF) • Assessing the roles of arbuscular mycorrhizal fungi in wetland plants and their importance in determining wetland plant community composition (NSF supported) • Determining the success of wetland creation efforts (support from the City of Grand Prairie) • Evaluating the capacity of wetland plants to remove contaminants and nutrients in constructed wetlands (support from the City of Denton and Tetra Point Fuels) • Evaluating competitive interactions among invasive plant species and agricultural crops (with the Texas Department of Agriculture) • Quantifying the effects of antimicrobial compounds and waste water treatment plant effluent on plant growth and development (with the City of Denton) • Screening wetland plant species for economic development with emphasis on fiber producing species (with the College of Engineering, Department of Material Science and Engineering) <p>Barney Venables</p> <ul style="list-style-type: none"> • Studies fate and effects of trace environmental contaminants • As a member of the plant signaling cluster, studies are aimed at describing molecular control of critical plant and animal functions involving growth, metabolism and defense. Most of this work has focused on the evolution of the endocannabinoid system in cytoprotection and whole organism defense responses. • Work with trace toxic contaminants includes describing environmental distribution, bioaccumulation and sublethal biological effects. Most of this work has focused on the widely distributed antimicrobial compounds triclosan and triclocarban. • Primary research tools involve the use of instrumental analyses, including atomic spectroscopy, gas and liquid chromatography and mass spectrometry, for contaminant residue analyses and endogenous biomolecule analyses including metabolomics and proteomics. <p>IAS Facilities</p> <ul style="list-style-type: none"> • Aquatic Toxicology and Reservoir Limnology Lab- As one of the foremost aquatic toxicology laboratories in the Southwest, the lab is equipped to conduct acute and chronic toxicity tests with freshwater and marine organisms for industries and municipalities on the effects of chemicals on aquatic ecosystems. The reservoir limnology program conducts water quality research on rivers and reservoirs throughout Texas. • Center for Remote Sensing (CRS)- The Center for Remote Sensing (CRS) applies remote sensing technologies and Geographic Information Systems (GIS) to land use and water resources issues to develop new and innovative techniques for managing the multiple, diverse types of information required to make informed and balanced decisions about natural resources and promote ecosystem level analyses for land management questions. • Center for Watershed and Reservoir Assessment and Management - Surface reservoirs in Texas currently provide 55 percent of drinking water for Texas citizens and serve as significant sources of water for agriculture, industry and recreation. However, maintaining these services is becoming increasingly more difficult and complex. The center offers scientific knowledge and expertise to address the current and emerging watershed scale issues of Texas. The center's expertise is based on 60 years of problem-solving research and state-of-the-art capabilities. • Ecological Risk Assessment/Water Research Field Station - UNT has two of the few facilities in the U.S. designed to assess, under field conditions, the effects of new chemicals and pesticides on aquatic ecosystems prior to their use in the general environment. The Water

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		<p>Research Field Station (WRFS) consists of 48 aquatic testing ponds of 0.1 acre each and 52 1,000- and 10,000-liter microcosms. The Artificial Stream Facility has 12 replicate five-meter streams, each capable of being colonized by aquatic species. The WRFS is specifically designed to assess the impacts of agrichemicals on aquatic populations and communities. The field station and stream facility are supported on campus by a biological and residue analysis laboratory with state-of-the-art equipment.</p> <ul style="list-style-type: none"> • Elm Fork Education Center • Center for Environmental Archaeology - The institute's faculty are experienced in the design and implementation of cultural resource management projects. The emphasis is on reconstruction of past environments and cultural ecology as part of archaeological research. Quaternary geologic studies are supported by a sediment-soils laboratory that has full capabilities for mechanical, chemical and mineralogical analyses of samples from archaeological sites and natural deposits. A comparative osteology lab maintains an extensive collection of animal skeletons for zooarchaeological research and forensic analysis. An off-campus lab includes facilities for artifact washing and cataloging, detailed analysis and artifact curation. Environmental geology, groundwater hydrology, geomorphology, soil science, sedimentology and hydrology research are also conducted. • Lewisville Lake Environmental Learning Area (LLELA) - The mandate of the LLELA is to develop the area for the preservation and restoration of native habitat and biodiversity, environmental education, and environmental research.
CAS	ECONOMICS	Michael Nieswiadomy - research has focused on issues related to endangered species, water consumption, recycling, and current research project investigates the benefits of low head dams.
CAS	ENGLISH	<p>David Taylor</p> <ul style="list-style-type: none"> • Poet, nature writer, and specialist in environmental literature. Work includes: <ul style="list-style-type: none"> ○ <i>Restoring Home: Essays on Family and Place</i>. Forthcoming 2009. Collection of essays on ecological restoration. ○ <i>South Carolina Nature Writers: 1860-1970</i>. Forthcoming 2010. Anthology of post-Darwin nature writing in South Carolina. ○ <i>Pride of Place: A Contemporary Anthology of Texas Nature Writing</i>. 2006. Anthology of recent Texas nature writers. • Organized Writing a Wide Landscape: A Texas Nature Writing Conference, a one day conference focused on interdisciplinary nature writing in Texas. Over 100 people attended the conference and all major university presses in Texas were present.
CAS	GEOGRAPHY	<p>Don Lyons</p> <ul style="list-style-type: none"> • Works in the area of industrial ecology (IE), in which manufacturing is viewed as an industrial ecosystem. • Strives to develop a more integrated "closed-loop" model for industrial activities, where raw material extraction and waste generation are minimized and pre- and post-consumer waste materials and by-products return to various parts of the production system. • My interest lies in trying to understand the spatial scale(s) at which wastes and by-products return to the production/consumption system. <p>Lisa Nagaoka</p> <ul style="list-style-type: none"> • Research on the effects of human-induced environmental change, such as animal population declines and extinction or resource depletion, on humans during prehistory in New Zealand and south Texas • Research also uses paleozoological data to assist wildlife managers in decisions about species management. <p>Steve Wolverton</p> <ul style="list-style-type: none"> • Research focuses on conservation paleozoology which uses datasets from prehistory to establish baselines (for better or worse) for conservation • Research on the global distribution of net primary productivity, which argues that the temperate latitudes are at least as important as the tropical latitudes in terms of plant and animal biomass. Thus, preserving and restoring temperate forests, not just tropical forests, are also necessary to overcome the effects of global warming. • Research on the overabundance of white-tailed deer in central Texas that shows deer today are causing ecosystem decay in central Texas. Deer have overpopulated the region because of the lack of predators and the social and political stigma about culling. As a result, deer have overeaten their range such that native hardwood populations have declined dramatically

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		<p>and opportunistic, fire-fuel rich junipers have colonized much of the open habitat.</p> <ul style="list-style-type: none"> • Research on black bears in Missouri from the early historic period demonstrates that these bears were relatively large compared to other parts of North America. Thus, current population restoration efforts need to take this larger body size into account when planning for expected food requirements, territorial range expectations, and population density. • Research on mussel biogeography in Texas, shows that modern impoundments for water reservoirs, water treatments, and other modern impacts to Texas streams have radically altered the modern mussel community compared to just a couple of thousand years ago. <p>Center for Spatial Analysis and Mapping (CSAM) - provides instructional and research support in the areas of geographic information systems (GIS), computer cartography, spatial analysis, and environmental modeling.</p> <p>Hydrogeology Lab - supports teaching and research in groundwater supply and contamination issues. Recent projects include developing new equipment for measuring the hydraulic conductivity of rock aquifers, determining chemical ratios in water from animal feedlots, monitoring water quality at a field station near the Denton Airport, quantifying the composition of residential and commercial solid waste in Denton, devising groundwater monitoring strategies near landfills, studying groundwater-surface water interactions at local wetlands, building filter cartridges to remove contaminants from groundwater, and visualizing subsurface contamination at toxic waste facilities.</p>
CAS	RTVF	Melinda Levin - Directing two documentaries dealing with Environmental issues
CAS	PHILOSOPHY	<p>Six of ten full-time, tenure and tenure track faculty concentrate their research in environmental philosophy and ethics and two of the remaining four concentrate their research in religion and ecology/nature. Two senior members of the faculty are among the founders of the field and one is a past president of the International Society for Environmental Ethics.</p> <p>We offer the only philosophy graduate program (MA and PhD) in the world with a concentration in environmental philosophy and ethics</p> <p>The department is home to the Center for Environmental Philosophy, which publishes the first (since 1979) and still leading journal in the field, <i>Environmental Ethics</i>, edited by the founding editor, which deepens the green profile of UNT.</p> <p>Two international reference works are edited by UNT philosophy faculty, which deepen the green profile of UNT:</p> <ul style="list-style-type: none"> • <i>Environmental Philosophy: Critical Concepts in the Environment</i>—a five-volume collection of classic and important papers, published by Routledge in 2005. • <i>The Encyclopedia of Environmental Ethics and Philosophy</i>—a two-volume A-Z encyclopedia containing 320 articles, published by Macmillan in 2008.
COEd	KINESIOLOGY	<p>Joseph Walker</p> <ul style="list-style-type: none"> • Research involves investigating sustainable operation and development strategies that can be incorporated into community recreation design, such as developing walkable communities. • Looks at the development of sustainable land management practices (environmental sustainability to reduce operation cost, development cost, and incorporate and protect native species and habitats) and facility/program development practices (economic sustainability that provides long term revenue or recovery to reduce cost or off set cost by incorporating opportunities that can compete within the commercial market and from fees or tax revenue). This development does play a role in social development as alterations to existing city resources or policy changes can change use patterns of the existing residents - so when developing a strategy I also examine what positive social (dog parks currently function as a venues for cultures to interact) or negative social (tourism can actually alter the existing social structure and displace or transform existing cultures) impacts could arise. • Future activities include assisting a local park department develop a sustainable economic/development strategy for a future park property in Denton County. <p>John Collins</p> <ul style="list-style-type: none"> • Developing public park space and walking trails. Sustainability is a component of park development and trail development.

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COEng	ELECTRICAL ENGINEERING	<p>Miguel Acevedo</p> <ul style="list-style-type: none"> • Texas Environmental Observatory (TEO) - TEO aims to provide near real-time data on environmental conditions in the State of Texas using ground based network of observatories. And it also provides cyber infrastructure to make these data readily available to the public and amenable to modeling, analysis and synthesis.- This laboratory develops and uses mathematical models and computer simulations for the assessment of risks and impacts of anthropogenic stressors on ecological systems. Research is conducted at local, landscape, regional and global scales. The main themes of the laboratory involve linking of environmental models to remote sensing, GIS and other advanced technology in order to understand landscape and regional dynamics; reveal global change effects on ecosystems; and to relate environmental policies to environmental issues and economic development.
COEng	ENGINEERING TECHNOLOGY	<p>Mitty Plummer – working on a liquid nitrogen powered car as one way of storing and recovering energy. The promise of this technology should be considered a direct competitor for battery technology since more energy can be stored in a kilogram of liquid nitrogen than can be stored in a kilogram of any type of battery available to date. The cost of the nitrogen, when made storing energy from nuclear power plants operating during periods of reduced electrical demand (hence, reduced cost), works out to a fuel cost of about \$0.05/mile which is very favorable.</p>
COEng	MATERIAL SCIENCES	<p>Nandika D'Souza</p> <ul style="list-style-type: none"> • packaging based on biodegradable polymers • using supercritical co2 which is an environmentally benign manufacturing process • using plant based fibers together with Brian Ayre, Kevin Stevens and Kent Chapman to make composites that could be used for applications such as wind energy turbines <p>Brian Gorman – fuel cells and photovoltaics</p> <p>Nigel Shepherd –collaborating with Chemistry (Dr. Mohammad Omary) and funded by the DoE on organic light emitting diodes, which require significantly less energy to produce and operate compared to their inorganic counterparts, and, tend to be less toxic. We are currently expanding our efforts to include solar cells and fuel cells which are also sustainable technologies, and we expect sustained funding in this area over the next several years.</p>
CPACS	CENTER FOR PUBLIC SERVICE	<p>Stan Ingman Creation of <i>Sustainable Communities Review</i>, 1997. (Now Online- www.cps.unt.edu). May move journal to LSU at Monroe, LA in Fall.</p> <ul style="list-style-type: none"> • Based upon recommendation of Development office established nonprofit Future Without Poverty, Inc. • Established student Chapter FWP at UNT 2006. Main Office of FWP will move to campus of University of Northern Kentucky, by invitation. • Establishing student Chapter at Haskell Indian Northern University • Future students chapters at University of Northern Kentucky, James Madison, LSU-Monroe, Florida, Wisconsin possible. • Major goal: Decrease Poverty by building sustainable communities using alternatives energy, water conservations and small businesses as part of the agenda for FWP . . • Establishment of Sustainable Technology Unit / Network. Includes Organizations in USA and Mexico. • Alternative Energy for Sustainable Communities Initiatives • Solar Panel Construction / Installation in Mexico <ul style="list-style-type: none"> o Four Systems Installed in rural schools in State of Zacateca o Three panels installed in San Martin in the State of Jalisco. o One panel installed in Flor de Campo on home. o Initial Panel Constructed by UNT student, students from La Grone Advanced Technology Complex designed new panel systems . o Haskell Indian Nation University Students assisted with Installation. Now plan to install Solar Panels at their University and in Indian reservations. o Virginia Boy Scout and Team build 12- 20 watt panels for San Martin and because of mistake in design , systems did not work after a few hours. New system will be designed in Fall and tested. o Will install solar panel at La Grone ATC in Fall for outdoor sign. o In addition to 250 rural schools that need alternative energy solutions, we have assessed

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		<p>poor rural senior housing needs and plan to explore “ solar panels for senior “ as new project in Mexico. Many seniors can not afford to buy both food and electricity. .</p> <ul style="list-style-type: none"> • Micro Wind Power <ul style="list-style-type: none"> ○ Plan to install small wind turbine at La Gone AT Complex in 2008 ○ Chinese Micro Wind Turbine being assessed by La Gone ATC students and teachers in Fall 2008. Will be sent to Mexico in Fall for testing. • Micro Wheel Generation- Bike System – for operating individual computer designed in Summer, and will be refined in Fall for testing in Mexico. <p>Water Conservation</p> <ul style="list-style-type: none"> ○ Assist with Creation of Water Harvesting Business in Denton, Texas. <ul style="list-style-type: none"> ▪ Pioneer Tank donates 52,000 gallon water tank for orphanage in the State of Jaisco near Guadalajara. ▪ Long term goal: introduction of water harvesting in to Mexico. ○ Gravity Feed Water System for San Martin 2006 ○ Chicken / Fish Farm with drip irrigation for gardens for Flor de Campo 2007 <p>Energy Efficient Affordable Housing</p> <ul style="list-style-type: none"> ○ Denton Affordable Housing Cooperation Partly stimulated fourteen “green” houses by Dr. Dickson, Hunter and Ingman. <ul style="list-style-type: none"> ▪ Help locate “green” builder. ▪ Help locate water harvesting contractor (assist school of Visual Arts) ▪ Assist with public relations in North Texas, of the six houses sold three have been sold to senior citizens. ▪ Seven senior sustainable living communities being designed for rural Missouri, Oklahoma, and Illinois utilizing some the ideas from DAHC project. <p>David McEntire – examines sustainable development in the context of disasters and emergency management.</p>
CVAD		<p><i>Rainmakers' Workshop</i> - With the support of Diana Block (retired Director of the University of North Texas Art Gallery - UNTAG), the College of Visual Arts and Design (CVAD), the UNTAG staff, and the Department of Philosophy in the College of Arts and Sciences, Bulgarian-born, New York-based artist Daniel Bozhkov designed a series of small gardens, pond and rainwater catchment and irrigation system, for the CVAD building. Incorporating a surplus UNT dump truck (a veteran of many landscape projects on campus), this sculptural installation deconstructs the notion of a garden, celebrates Texas native and adapted plants and the resourcefulness of rainwater use. Members of the UNT Facilities outfitted the roof of the CVAD building with PVC piping that would direct rainwater run-off into a 6800 gallon tank which in turn feeds a pond and several adjoining gardens. The garden was installed February – March of 2007 and continues to exist outside the CVAD building.</p>

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CAS	FOREIGN LANGUAGES	<ul style="list-style-type: none"> Minimize paper usage <ul style="list-style-type: none"> by posting course readings and documents using WebCT Vista for 30% of classes . by purchasing a new copier that allows faculty members to scan documents so that syllabi and various class documents are available on line. by considering to offer placement tests on- line Partial on-line and on-line labs/courses have been initiated in 2007-08 and are being planned for Fall 2008.
CAS	RTVF	<ul style="list-style-type: none"> Replaced all CRT (tube) type computer monitors in KNTU, NTTV, and the TV production studios and master control down-stairs with flat panel monitors donated by another department. CRT type monitors emit small amounts of radiation; flat panel type monitors do not and are safer for workers. Properly disposed of 100+ old NiCad batteries that were no longer in use from NTTV and the equipment check-out room
CAS	PHILOSOPHY	<ul style="list-style-type: none"> We buy only recycled paper. Photocopy on both sides of the page and encourage faculty to distribute syllabi and other documents electronically Use no disposable cups or other containers.
CAS	WOMEN'S STUDIES PROGRAM	<ul style="list-style-type: none"> Buying recycled products when available and cost effective. Using CFL bulbs in all lamps. Providing a container for plastic recyclables, such as water bottles, etc. Encouraging adjuncts and office staff to bring computer cartridges, etc., from home for us to donate to the Chiapas project.
CVAD		Exhibition design at UNT Art Gallery - The UNT Art Gallery practices under a policy of reusability and recycling. Whenever possible we reuse materials, like plywood and beams in the construction of temporary walls. In addition, we take care to use as little paint as needed and promote the practice of spot painting between exhibitions. These practices allow the UNT Art Gallery to use fewer materials and recycled materials.
CPACS	PUBLIC ADMINISTRATION	<ul style="list-style-type: none"> recycles ink cartages, paper, cell phones is initiating steps to become paperless where applicable (e.g.,expansion of department Web site and online readings for students).
Facilities	RECYCLING	<ul style="list-style-type: none"> Chiapas – phones and toner cartridges. Proceeds to the Chiapas Project Currently UNT Recycling collects the following materials: Paper, aluminum, plastic, cardboard, Styrofoam, printer cartridges, fluorescent tubes. FY 2008 results through February – 133 tons of paper and 56 tons of cardboard have been collected and sold; generating about \$24,000 which is put back into the recycling program.
	GROUND'S & LANDSCAPING	<ul style="list-style-type: none"> Shredded hardwood mulch is made from pruned limbs and deceased trees and is being placed under campus trees to protect their roots and provide a moisture retention factor Micro+plus , an organic soil additive, is used to create healthier soils for the landscape plants and turfgrass that we plant and maintain Micro+plus also works to keep fire ants out of the maintained areas, thus we do not have to use insecticides for fire ant control Use the EARTHKIND soil preparation process to create beneficial soils for campus landscape beds. We excavate 8 inches of clay soil, add 3 inches of expanded shale and rototill into 6 inches of clay, add 3 inches of pH balanced compost and rototill into the above clay/shale mix, add 3 inches of composted shredded hardwood mulch once landscape plants are planted for moisture retention purposes and as a means to add organic material as the mulch breaks down. Predominantly use Native plants, plus some well adapted plants Rarely use insecticides, only if the economic damage point is impending Most large equipment is diesel not gasoline Plant trees along sidewalks to cool the concrete Make every effort to save large campus trees Have added scooters for shop vehicles instead of trucks Have added rain/freeze sensors to all irrigation clocks We are in the process of adding soil moisture meters, flow meters and a Centralized irrigation control system so all controllers can be operated/adjusted from the main office. We prolong the life of our equipment (well past their intended lifespan) with a high standard of

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		regular maintenance, thus do not add to the junkyard.
	CUSTODIAL	<ul style="list-style-type: none"> • EnvirOx H2Orange2 concentrate 117 for glass cleaning. In the process of installing chemical dispensing units in all buildings over the next year. Glass cleaner will change to Green Earth Cleaner which is green seal certified. • Encapsulating carpet cleaning system (low moisture). • We are changing to furniture polish wipes and stainless steel cleaner wipes thus reducing the use of aerosols. • Eliminator carpet spotter towels. • We assist with cardboard recycling during daily trash removal in buildings. Assist with recycling of paper by emptying the 23 gal. totes to the large totes that are located in each buildings collection location. • Evaluating the effectiveness of green seal floor stripper and floor finish. • Evaluating a broom that is made from recycled plastic and can be recycled. • Evaluating wet mops made from recycled plastic that can also be recycled. • Evaluating dust mop head made from recycled plastic that can also be recycled.
	FLEET	<ul style="list-style-type: none"> • A major effort has been made by Housing maintenance and facilities to downsize vehicles and purchase vehicles which are more efficient. No stats yet. • The Elm Fork Education Center operates a 40 passenger bus that runs on natural gas. The bus is used transport students to and from EFEC, and emits far less carbon per person than even the best of the famous hybrid cars.
	TRANSPORTATION	<ul style="list-style-type: none"> • The DCTA provide contracted bus services to UNT, both on campus and from local apartment complexes to and from campus. Bus ridership has averaged 10 – 12,000 passengers per day. • UNT recently opened the campus to encourage bicycle use and installed close to 2,000 bicycle parking spaces
	PURCHASING	<ul style="list-style-type: none"> • There are currently no green purchasing policies in place although departments do make efforts to purchase paper with recycled content when possible. • Facilities has been working with suppliers who recycle carpet tiles.
	BUSINESS SERVICES	<ul style="list-style-type: none"> • Replacement of all shower heads with low flow, air injected ones. See attached chart for calculated savings. • Replacement of most faucet aerators with low flow. See attached chart for calculated savings. • Replacement of all top load washers with front load. See attached chart for calculated savings. • Replacement of 5 water cooled ice machines. • Ongoing conversion of traditional with native/sustainable landscaping • Ongoing conversion of irrigation systems to include soil moisture sensors, rain sensors, and lower evaporative heads. • Replacement of single pane windows with thermally efficient, low e, dual pane. All halls, but Kerr have been converted. • Conversion from steam building boilers to domestic hot water boilers for the provision of domestic hot water. This allows the steam boilers to be brought down during warm weather months. • Conversion from steam to hot water in the HVAC systems. This is more thermally efficient, as well as variable in temperature – during mild weather, we can run at a lower water temperature. Steam is steam. • Change to the use of low emission carpet, paint and wall coverings. • Installation of a third generation control system for the HVAC systems, as well as Dining Services refrigeration systems. • Conversion to high efficiency fluorescent lighting. • Replacement of the majority of our fleet of large trucks with smaller vehicles, including some electric. This has reduced our fuel bill by approximately 42%. • In the process of adopting Green Seal Cleaning Methods. • In addition, we are researching condenser and runoff water capture for reuse or irrigation.
	ENERGY	<ul style="list-style-type: none"> • Initiated replacement of most faucets with low flow automatic shut off fixtures. • Installation of native/low water landscaping plantings in new projects. • Ongoing conversion of irrigation systems to include soil moisture sensors, rain sensors, and lower evaporative heads. • Replacement of inefficient steam and hot water boiler heating systems with high efficiency hot water boilers. • Installation of separate domestic hot water boilers for the provision of domestic hot water. This

COLLEGE	DEPARTMENT	DESCRIPTION
		<p>allows the steam boilers to be brought down during warm weather months.</p> <ul style="list-style-type: none"> • Change to the use of low emission carpet, paint and wall coverings. • Conversion to high efficiency fluorescent lighting. • Installation of LED exit signs in most facilities. • Energy Savings Performance Contract (ESPC): Initial contract signed in 1997 with 10 year performance period beginning 9/1/1999. Guaranteed annual savings of \$1,221,462 which has been exceeded each year. Contractor replaced inefficient lighting with electronic ballast, more efficient fluorescent tubes and incandescent with compact fluorescent. Direct digital control system was installed on most mechanical equipment. Variable frequency drives were installed on pump and fan motors. Following are the calculated savings. • Installed a heat harvester in the PEB building to capture heat given off by the cooling tower during the cooling process to heat the swimming pool, reducing the requirement to run a boiler to heat the pool • A second ESPC is currently being pursued to capture additional savings and apply newer technologies to systems.
	BUILDINGS	<p>LEED Construction; The Board of Regents has approved the campus plan to build all new major construction projects to achieve at least a LEED silver standard.</p>

ANNUAL ENERGY SAVINGS

	Annual Savings			
	Electric Energy	Electric Demand	Natural Gas	Savings
	kWH/yr	kVA/yr	MCF/yr	\$/yr
Direct Digital Controls of AHU	1,966,500	3,138	33,360	\$164,530
CV to VAV Terminal Unit	7,527,163	14,938	26,243	\$365,378
Lighting Efficiency	4,122,082	12,147	(4,936)	\$181,543
EMS Lighting Control	213,894	0	0	\$5,300
VAV Systems w/ VFD	1,863,103	2,389	2,168	\$69,752
Variable Flow Pumping w/ VFD	2,260,798	3,277	0	\$81,007
VFD on Cooling Tower Fans	294,770	1,589	0	\$19,417
Replace Chiller	1,665,699	4,018	0	\$71,906
EMS Scheduling and Control	880,016	121	2,312	\$28,639
High Efficiency Motors	11,698	395	0	\$3,293
Power Factor Correction	0	21,995	0	\$159,692
High Efficiency Package HVAC	27,357	182	0	\$2,131
EMS Optimization of Central Plant	2,367,810	2,893	1,895	\$85,534
Replace Boiler	0	0	416	\$1,171
Total Annual Estimated Savings	23,200,890	66,042	61,477	\$1,239,293

WATER SAVINGS IN PLACE BY APRIL 15, 2008

	Units	# of Operations	Gallons Saved per Operation	Gallons Saved	Dollars Saved
Washing Machines	168	154000	14	2,156,000	\$15,092
Shower Heads	2800	560000	5	2,800,000	\$19,600
Faucet Areators	3600	800000	2	1,600,000	\$11,200
Ice Machines	5			520,000	\$3,120
Pre Rinse valves	13	3	150	1,170,000	\$7,020
Total estimated savings				8,246,000	\$56,032

**ATTACHMENT 2:
STARS¹ CATEGORIES OF
SUSTAINABILITY RATINGS**

**¹Association for the Advancement of
Sustainability in Higher Education's
*SUSTAINABILITY TRACKING, ASSESSMENT
AND RATING SYSTEM (STARS)***

CATEGORY 1: EDUCATION & RESEARCH (ER)

Co-Curricular Education

ER Credit 1 Student Sustainability Outreach Program

At least 1 peer-peer sustainability outreach program for students per semester. **1**

ER Credit 2 Sustainability_Related Competition

At least 1 sustainability competition per year. **1**

ER Credit 3 Sustainability in New Student Orientation

Sustainability prominently included in new student orientation **1**

Multiple Tier Two credits (no points, but "braggin'-rights") student groups, organic garden, model dorm room, etc.

Curriculum

ER Credit 4 Sustainability Course Identification

Courses identified as sustainability-focused or sustainability-related. **1**

ER Credit 5 Sustainability_Focused Academic Courses

Between 0 and 0.1 percent of UNT courses identified as sustainability focused. **1**

Between 0.1 and 1 percent of UNT courses identified as sustainability focused. **2**

Between 1 and 2 percent of UNT courses identified as sustainability focused. **3**

Between 2 and 3 percent of UNT courses identified as sustainability focused. **4**

Between 3 and 4 percent of UNT courses identified as sustainability focused. **5**

Between 4 and 5 percent of UNT courses identified as sustainability focused. **6**

ER Credit 6 Sustainability_Related Academic Courses

Between 0 and 0.1 percent of UNT courses identified as sustainability related. **1**

Between 0.1 and 1 percent of UNT courses identified as sustainability related. **2**

Between 1 and 2 percent of UNT courses identified as sustainability related. **3**

Between 2 and 3 percent of UNT courses identified as sustainability related. **4**

Between 3 and 4 percent of UNT courses identified as sustainability related. **5**

Between 4 and 5 percent of UNT courses identified as sustainability related. **6**

ER Credit 7 Sustainability Courses by Academic Department

More than 5%, and up to 10% of UNT departments offer a focused or related course. **1**

Between 10 and 30% of UNT departments offer a focused or related course. **2**

More than 30% of UNT departments offer a focused or related course. **3**

ER Credit 8 Academic Sustainability Courses by Student Credit Hours

More than 0.1%, and up to 1% of student credit hours are in related/focused courses. **1**

Between 1 and 2% of student credit hours are in related/focused courses. **2**

Between 2 and 3% of student credit hours are in related/focused courses. **3**

Between 3 and 4% of student credit hours are in related/focused courses. **4**

Between 4 and 5% of student credit hours are in related/focused courses. **5**

5% or more of student credit hours are in related/focused courses. **6**

ER Credit 9 Sustainability_Focused Undergraduate Academic Program

Sustainability-focused UG major, concentration, certificate or minor offered. **1**

At least 1% of UG students graduate with a sustainability-focused major/conc, etc. **2**

ER Credit 10 Sustainability Graduation Requirement

More than 0%, and less than 25% of acad. depts. have a sustainability graduation reqmt. **1**

Between 25 and 50% of academic departments have a sustainability requirement. **2**

Between 50 and 75% of academic departments have a sustainability requirement. **3**

Between 75 and 100% of academic departments have a sustainability requirement. **4**

100% of departments, or institution-wide sustainability course graduation requirement **5**

ER Credit 11 Sustainability_Focused Graduate Academic Program*

Sustainability-focused graduate major, concentration, certificate or minor offered. **1**

At least 1% of graduate students graduate with a sustainability-focused major/conc, etc. **2**

CATEGORY 1: EDUCATION & RESEARCH (ER)

ER Credit 12 Sustainability Study Abroad Program*	
<i>UNT offers a sustainability related/focused study-abroad program.</i>	1
ER Credit 13 Non_Credit Sustainability Courses*	
<i>Any portion of non-credit courses are sustainability related/focused</i>	1
<i>1 to 5% of non-credit courses are sustainability related/focused</i>	2
<i>More than 5% of non-credit courses are sustainability related/focused</i>	3
ER Credit 14 Sustainability Focused Non_Academic Certificate Program*	
<i>UNT offers a non-academic sustainability related/focused certificate or training program.</i>	1
<i>At least 1% of students in non-academic programs participate in sustainability programs.</i>	2
ER Credit 15 Curricular Engagement	
<i>UNT meets Carnegie Foundation's Curricular Engagement Elective classification.</i>	1
ER Credit 16 Sustainability Literacy Assessment	
<i>UNT conducts an assessment of its students' sustainability literacy.</i>	1
<i>UNT assesses incoming, and then graduating students' sustainability literacy.</i>	2
Faculty and Staff Development and Training	
ER Credit 17 Incentives for Developing Sustainability Courses	
<i>UNT offers incentives for faculty to develop sustainability related/focused courses.</i>	1
ER Credit 18 Sustainability in New Employee Orientation	
<i>UNT covers sustainability topics in new employee orientations and/or packets.</i>	1
ER Credit 19 Employee Sustainability Outreach Program	
<i>UNT administers faculty/staff peer-to-peer sust. outreach program once per semester.</i>	1
Research	
ER Credit 20 Research Inventory*	
<i>UNT has inventory of all sust. Research initiatives (centers, labs, professors' activities)</i>	1
ER Credit 21 Research Incentives*	
<i>UNT offers incentives for faculty to conduct sustainability research.</i>	1
ER Credit 22 Faculty Involved in Sustainability Research*	
<i>Up to 0.1% of UNT faculty are engaged in sustainability research.</i>	1
<i>0.1 to 1% of UNT faculty are engaged in sustainability research.</i>	2
<i>More than 1% of UNT faculty are engaged in sustainability research.</i>	3
ER Credit 23 Departments Involved in Sustainability Research*	
<i>Up to 5% of academic departments are engaged in sustainability research.</i>	1
<i>5 to 15% of academic departments are engaged in Sustainability research.</i>	2
<i>15 to 25% of academic departments are engaged in sustainability research.</i>	3
<i>25 to 35% of academic departments are engaged in sustainability research.</i>	4
<i>More than 35% of academic departments are engaged in sustainability research.</i>	5
ER Credit 24 Internal Research Expenditures*	
<i>UNT demonstrates a three-year upward trend in internal research funds on sust.</i>	1
<i>Between 0.01 and 1% of UNT's internal research funds are devoted to sust. research.</i>	1
<i>Between 1 and 5% of UNT's internal research funds are devoted to sust. research.</i>	2
<i>Between 5 and 10% of UNT's internal research funds are devoted to sust. research.</i>	3
<i>More than 10% of UNT's internal research funds are devoted to sust. research.</i>	4
ER Credit 25 External Research Expenditures*	
<i>UNT demonstrates a three-year upward trend in external research funds on sust.</i>	1
<i>Up to 0.1% of UNT's external research funds are devoted to suitability research.</i>	1
<i>Between 0.1and 1% of UNT's external research funds are devoted to sustainability research.</i>	2
<i>More than 1% of UNT's external research funds are devoted to sustainability research.</i>	3
ER Credit 26 Interdisciplinary Research*	
<i>UNT treats interdisciplinary the same as discipline-specific research for P&T decisions.</i>	1

CATEGORY 2: OPERATIONS (OP)

<i>Prerequisite 1: Recycling Program</i>	0
Buildings	
OP Credit 1 New Construction, Renovations, and Commercial Interiors*	
<i>All new buildings, major renovations and interior improvements (NRI): LEED certified</i>	1
<i>All NRI LEED silver or higher, and at least 25% of new sq.ft. is certified LEED silver or higher.</i>	2
<i>All NRI LEED gold or higher, and at least 25% of new sq.ft. is certified LEED gold or higher.</i>	3
<i>All NRI LEED platinum or higher, and at least 25% of new sq.ft. is certified LEED plat. or higher.</i>	4
OP Credit 2 Building Operations and Maintenance	
<i>Any portion of existing buildings are LLED-EB certified (any level).</i>	1
<i>At least 10% of existing buildings are LEED-EB (any level)and another 40% of sq.ft. meet LEED-EB criteria.</i>	2
<i>At least 15% of existing buildings are LEED-EB silver and another 60% of sq.ft. meet LEED-EB silver criteria.</i>	3
<i>At least 20% of existing buildings are LEED-EB gold and another 70% of sq.ft. meet LEED-EB gold criteria.</i>	4
<i>At least 20% of existing buildings are LEED-EB platinum and another 70% of sq.ft. meet LEED-EB platinum criteria.</i>	5
OP Credit 3 Potable Non_Irrigation Water Consumption Reduction	
<i>UNT reduces potable, non-irrigation water consumption per sq.ft. of building space by 10%.</i>	1
<i>UNT reduces potable, non-irrigation water consumption per sq.ft. of building space by 25%.</i>	2
<i>UNT reduces potable, non-irrigation water consumption per sq.ft. of building space by 50%.</i>	3
OP Credit 4 Green Cleaning Service	
<i>UNT's in-house or contracted cleaning service is Green Seal certified or meets GS-42 standard.</i>	1
<i>Multiple Tier Two credits (no points, but "braggin'-rights") - waterless urinals, showerheads, etc.</i>	
Dining Services	
OP Credit 5 Local Food*	
<i>5% of food expenditures go toward local food.</i>	1
<i>20% of food expenditures go toward local food.</i>	2
<i>50% of food expenditures go toward local food.</i>	3
OP Credit 6 Food Alliance and Organic Certified Food*	
<i>5% of food expenditures go toward Food Alliance and/or organic food products.</i>	1
<i>20% of food expenditures go toward Food Alliance and/or organic food products.</i>	2
<i>50% of food expenditures go toward Food Alliance and/or organic food products.</i>	3
OP Credit 7 Fair Trade Coffee*	
<i>All UNT's coffee (dorms, UNT catering, etc. - exception: on-site franchises) are Fair Trade certified.</i>	1
Energy and Climate	
OP Credit 8 Energy Intensity Trend (normalized for heating or cooling degree days)	
<i>UNT reduces energy intensity (total energy consumption plus temperature control) up to 2% (past 3 yrs).</i>	1
<i>UNT reduces energy intensity (total energy consumption plus temperature control) by more than 2% (past 3 yrs).</i>	2
<i>UNT reduces energy intensity (total energy consumption plus temperature control) by more than 4% (past 3 yrs).</i>	3
OP Credit 9 Renewable Electricity	
<i>More than 5% of electricity consumed is from institution_catalyzed* renewable energy sources, or the environmental attributes of more than 15 percent was purchased in the form of Renewable Energy Certificates (RECs) and other similar renewable energy products.</i>	1
<i>More than 15% of electricity consumed is from institution_catalyzed* renewable energy or 100% was purchased in the form of RECs and other similar renewable energy products.</i>	2
<i>More than 35% of electricity consumed is from institution_catalyzed* renewable energy sources.</i>	3
<i>More than 65% of electricity consumed is from institution_catalyzed* renewable energy sources.</i>	4
<i>100% percent of electricity consumed is from institution_catalyzed* renewable energy sources.</i>	5
OP Credit 10 On_Site Combustion with Renewable Fuel	
<i>UNT derives 15% or more of its on-site combustion for heating/cooling from renewable sources.</i>	1
<i>UNT derives 50% or more of its on-site combustion for heating/cooling from renewable sources.</i>	2
<i>UNT derives 100% or more of its on-site combustion for heating/cooling from renewable sources.</i>	3

CATEGORY 2: OPERATIONS (OP)

OP Credit 11 Greenhouse Gas (GHG) Emissions Reductions

<i>UNT reduced GHG emissions by at least 5%, or purchased offsets to achieve 50% reduction.</i>	1
<i>UNT reduced GHG emissions by at least 20%, or purchased offsets to achieve 100% reduction.</i>	2
<i>UNT reduced GHG emissions by at least 40%.</i>	3
<i>UNT reduced GHG emissions by at least 65%.</i>	4
<i>UNT reduced GHG emissions by 100% (carbon neutrality), with carbon offsets accounting for less than 15%.</i>	5
<i>Multiple Tier Two credits (no points, but "braggin'-rights") - time/motion temp/lights, centralized energy mgmt. etc.</i>	

Grounds

OP Credit 12 Organic Campus*

<i>UNT only uses pesticides and fertilizers allowable under USDA's standards for organic crop production.</i>	1
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OP Credit 13 Irrigation Water Consumption*

<i>UNT meets 50% of irrigation needs with non-potable water.</i>	1
<i>UNT meets 100% of irrigation needs with non-potable water.</i>	2
<i>Multiple Tier Two credits (no points, but "braggin'-rights") - native plants, inventory of trees, pervious paving, etc.</i>	

Materials, Recycling, and Waste Minimization

OP Credit 14 Waste Minimization

<i>UNT demonstrates 3-year downward trend in waste generation per capita.</i>	1
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OP Credit 15 Waste Diversion

<i>UNT achieves 15% landfill diversion rate.</i>	1
<i>UNT achieves 35% landfill diversion rate.</i>	2
<i>UNT achieves 50% landfill diversion rate.</i>	3

OP Credit 16 Construction and Demolition Waste Diversion

<i>UNT diverts at least 75% of non-hazardous construction and demolition waste from landfill/incinerator.</i>	1
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OP Credit 17 Electronic Waste Recycling Program

<i>UNT has a comprehensive e-waste recycling and/or reuse program (all institutional, at least annually for students).</i>	1
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OP Credit 18 Hazardous Waste Minimization

<i>Institution tracks and safely disposes of all hazardous, universal, and non-regulated chemical waste.</i>	1
<i>Multiple Tier Two credits (no points, but "braggin'-rights") -reusable mugs, limits printing in computer labs, etc.</i>	

Purchasing

OP Credit 19 ENERGY STAR Purchasing

<i>UNT purchases ENERGY STAR qualified products, or the equivalent, for all purchases with mechanism for tracking.</i>	1
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OP Credit 20 EPEAT Purchasing

<i>UNT purchases Electronic Product Env. Assessment (EPEAT) (silver) for all purchases with mechanism for tracking.</i>	1
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OP Credit 21 Purchasing Green Cleaning Products

<i>UNT purchases env. preferable cleaning products (criteria specific), for all purposes with mechanism for tracking.</i>	1
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OP Credit 22 Environmentally Preferable Paper Purchasing

<i>UNT purchases env. preferable copy paper and bathroom paper products (criteria specified).</i>	1
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OP Credit 23 Environmentally Preferable Furniture Purchasing

<i>At least 50% of UNT's furniture expenditures go towards env. preferable furniture (criteria specified).</i>	1
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OP Credit 24 Vendor Code of Conduct

<i>UNT has and acts on a vendor code of conduct that sets social and env. responsibility.</i>	1
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Transportation

OP Credit 25 Fleet Greenhouse Gas Emissions

<i>UNT's fleet emits 0.5 or fewer pounds of carbon dioxide equivalent per passenger mile traveled.</i>	1
<i>UNT's fleet emits zero pounds of carbon dioxide equivalent per passenger mile traveled (carbon neutral).</i>	2

OP Credit 26 Commute Modal Split

<i>More than 25% of UNT's population primarily uses preferable modes of transportation.</i>	1
<i>More than 55% of UNT's population primarily uses preferable modes of transportation.</i>	2
<i>More than 95% of UNT's population primarily uses preferable modes of transportation.</i>	3

OP Credit 27 Commuter Options

<i>UNT meets the criteria for being recognized by the Best Workplaces for Commuters program.</i>	1
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OP Credit 28 Air Travel

<i>UNT calculates greenhouse gas emissions from institution-funded air travel.</i>	1
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CATEGORY 3: ADMINISTRATION AND FINANCE (AF)

Prerequisite 1 Sustainability Committee	0
Investment	
AF Credit 1 Investment Transparency*	
<i>UNT makes investment pool and proxy voting records publically available online, updated at least annually.</i>	1
AF Credit 2 Committee on Investor Responsibility*	
<i>UNT has committee (faculty, staff and students), that makes investment recommendations to Board.</i>	1
AF Credit 3 Screening for Negative Investments*	
<i>UNT conducts negative screening of entire investment pool (tobacco, weapons manufacturing, etc.)</i>	1
AF Credit 4 Positive Sustainability Investments*	
<i>Up to 5% of UNT's investment pool is invested positively to advance sustainability.</i>	1
<i>Between 5 and 15% of UNT's investment pool is invested positively to advance sustainability.</i>	2
<i>Between 15 and 30% of UNT's investment pool is invested positively to advance sustainability.</i>	3
<i>More than 30% of UNT's investment pool is invested positively to advance sustainability.</i>	4
AF Credit 5 Shareholder Engagement*	
<i>UNT filed or co-filed one or more shareholder resolutions that address sustainability or submitted one or more letters about social or environmental responsibility to a company in which it holds investments (past 3 yrs).</i>	1
Planning	
AF Credit 6 Strategic Plan	
<i>UNT's strategic plan includes sustainability at a high level (an amendment will count).</i>	1
AF Credit 7 Master Plan	
<i>UNT's master plan that covers the entire physical campus includes sustainability at a high level (amendment OK).</i>	1
AF Credit 8 Sustainability Plan	
<i>UNT's sustainability plan, developed with faculty, staff and students, includes goals, strategies and timeframes.</i>	1
AF Credit 9 Climate Plan	
<i>UNT has a formal plan to mitigate its greenhouse gas emissions, with goals, strategies and timeframes.</i>	1
Sustainability Infrastructure	
AF Credit 10 Sustainability Officer	
<i>Any percentage of a paid staff member's time is dedicated to coordinating sustainability (in job description).</i>	1
<i>UNT has a full-time paid sustainability officer.</i>	2
<i>UNT has a full-time paid sustainability officer, with academic and operation purview, who reports to Pres or VP.</i>	3
AF Credit 11 Sustainability Recognition Program	
<i>UNT has an awards program that recognizes sustainability achievements (individuals, buildings, depts., etc.)</i>	1
AF Credit 12 Inter_Campus Collaboration on Sustainability	
<i>UNT partners with other colleges/universities to support and help build the campus sustainability community.</i>	1
<i>Multiple Tier Two credits (no points, but "braggin'-rights") -recycling coordinator, alumni sust. fund, etc.</i>	
Community Relations and Partnerships	
AF Credit 13 Community Service Infrastructure	
<i>UNT has a permanent community service coordinator/office/mechanism to facilitate community service.</i>	1
AF Credit 14 Student Participation in Community Service	
<i>Between 25 and 50% of UNT student body participates in community service.</i>	1
<i>Between 50 and 90% of UNT student body participates in community service.</i>	2
<i>Over 90% of UNT student body participates in community service.</i>	3
AF Credit 15 Student Hours Contributed in Community Service	
<i>UNT engages students in at least 1 and less than 5 hours of community service per FTE student per year.</i>	1
<i>UNT engages students in 5 to 10 hours of community service per FTE student per year.</i>	2
<i>UNT engages students in more than 10 hours of community service per FTE student per year.</i>	3
AF Credit 16 Financial Incentives for Public Service Careers*	
<i>UNT has financial incentive programs for graduates of JD or MBA programs who enter public service careers (yep, 3)</i>	3

CATEGORY 3: ADMINISTRATION AND FINANCE (AF)

AF Credit 17 Outreach & Partnerships Carnegie Designation	
<i>UNT meets criteria for Carnegie Foundation's "Outreach & Partnerships" classification.</i>	1
AF Credit 18 Public Policy Engagement	
<i>UNT advocates for federal, state or local public policies that support campus sustainability or that advance sust.</i>	1
Diversity, Access, and Affordability	
AF Credit 19 Diversity Committee	
<i>UNT has Diversity Committee (students, administrators) that meet once per semester, charged by admin.</i>	1
AF Credit 20 Diversity Officer	
<i>UNT has a diversity officer who reports to president/provost, with responsibility for directing diversity initiatives.</i>	1
AF Credit 21 Non-Discrimination Policy	
<i>UNT has a comprehensive non-discrimination statement (15 specific categories)</i>	1
AF Credit 22 Diversity Plan	
<i>UNT has a diversity plan that covers the entire institution.</i>	1
AF Credit 23 Recruiting for Student Diversity	
<i>UNT has programs and policies in place to recruit a diverse student body</i>	1
AF Credit 24 Support Programs for Under-represented Groups	
<i>UNT has mentoring, counseling, or other programs in place to support under-represented groups on campus.</i>	1
AF Credit 25 Support Programs for Under-represented Ph.D. Candidates	
<i>UNT has or participates in a mentoring or other program that supports doctoral candidates from under-rep groups.</i>	1
AF Credit 26 Affordability and Access Programs	
<i>UNT has policies and programs in place to make the institution accessible and affordable to low-income students.</i>	1
<i>Tier Two credits (no points, but "braggin'-rights") - UNT offers gender neutral housing options.</i>	
Human Resources	
AF Credit 27 Sustainable Compensation for Faculty and Staff	
<i>UNT periodically evaluates/updates wages and benefits to ensure compensation for lowest paid is sufficient.</i>	1
AF Credit 28 Faculty and Staff Benefits*	
<i>All full-time employees receive full health care coverage.</i>	1
<i>All employees with at least 0.75 full-time equivalence receive full health care coverage.</i>	2
<i>All employees with at least 0.5 full-time equivalence receive full health care coverage.</i>	3
AF Credit 29 Graduate Student Employee Benefits*	
<i>UNT covers 75% of graduate student employee's health care premiums.</i>	1
<i>UNT covers 100% of graduate student employee's health care premiums.</i>	2
AF Credit 30 Parental Leave*	
<i>UNT grants parental leave to all employees, including graduate students.</i>	1
AF Credit 31 Domestic Partner Benefits*	
<i>UNT provides equal benefits to employee's same-sex domestic partners as to employees' spouses.</i>	1
AF Credit 32 Employee Satisfaction Survey	
<i>UNT conducts survey at least once every three years to measure employee satisfaction.</i>	1
<i>Tier Two credits (no points, but "braggin'-rights") - on-site day care, whistler blower policy, part-time/job share.</i>	
Trademark Licensing	
AF Credit 33 Independent Monitoring of Logo Apparel*	
<i>UNT is a member of an organization that conducts monitoring and verification to ensure products with UNT logos are produced under fair conditions (e.g. Worker Rights Consortium or the Fair Labor Association).</i>	3
AF Credit 34 Designated Suppliers Program*	
<i>UNT participates in the Worker Rights Consortium's Designated Suppliers Program.</i>	1

**ATTACHMENT 3:
UNT TREE POLICY**

06.101 Policy Statement.

Trees provide numerous tangible and intangible benefits to the University of North Texas. Therefore, the University resolves to protect, nurture and renew this valuable resource following the tenants outlined in the Master Plan. To fulfill this commitment, UNT does hereby establish the following principles:

The university shall take all reasonable actions to protect and maintain the health of campus trees; and

Trees will be considered for removal only under certain circumstances hereinafter set out; and

Trees that are removed shall be replaced with suitably sized tree(s) of selected species.

06.102 Application of Policy.

This policy applies to individuals and functions operating on the University of North Texas campus.

06.103 Definitions.

1. Tree Advisory Committee. “Tree Advisory Committee” means a committee charged with providing guidance for future planning, approval of a comprehensive campus tree plan, education of the campus population as to the benefits of the campus trees, recommendations concerning the removal of trees, designation of trees as heritage or valuable and development of connectivity to the community.
2. Heritage Tree. “Heritage tree” means a landmark tree which is significant due to its species or size, or a tree which has historical or memorial significance to the university.
3. Valuable Tree. “Valuable tree” means a healthy tree of less significance than a heritage tree, but due to its size or species should be treated as a special asset. This includes species with limited population on campus, Post Oaks, Black Jack Oaks Live Oaks, Elms and Pecans and trees with a caliper in excess of 18 inches.

06.104 Procedures and Responsibilities.Procedures

A. TREES WILL BE MAINTAINED, PRESERVED AND PROTECTED

1. All reasonable efforts shall be made to maintain, preserve and protect trees and to keep them pruned, stabilized, and free from damages from the elements and disease.
2. Facilities will prepare a tree inventory documenting each tree by type, condition, location, age and value.
 - The inventory will be updated every five years.
 - a. The inventory will pay special attention to trees that can be classified as heritage trees. Heritage trees will also be identified in the UNT Master Plan and included in the landscape recommendations concerning their preservation.
 - b. The inventory will also designate appropriate trees as valuable trees.
 - c. The tree inventory will be presented to the Tree Advisory Committee in a timely manner for review and approval.
3. All reasonable efforts shall be made to limit the removal of trees on construction sites for new and expanded buildings, roads and utilities. The preservation of heritage trees in particular, because of their benefits to human health and welfare, enhancement of scenic beauty, improvement of property value, prevention of soil erosion, positive influence on climate change through carbon sequestration, and role in the history of the development of the university is an important component for the protection of UNT’s heritage.
 - a. The project manager shall work with the Grounds Manager, project architects, engineers and

landscape architects to limit tree removal, especially of heritage trees, through appropriate site development.

- b. Should a project require the removal of a tree(s), the construction project budget will include the cost of replacement trees as described in 06.104.D below.
4. All construction plans and specifications that effect site development shall require:
 - a. the identification of the trees to be protected,
 - b. the construction of barriers that protect the critical root zone around designated trees,
 - c. substantial monetary penalties per valuation by a certified arborist for the destruction and damage to such protected trees
 - d. designation of approved boring and trenching methods under trees in instances where utilities must be placed within the tree drip line,
 - e. monthly pictorial history on each designated tree for the duration of the construction period.
5. No trees shall be removed without adherence to the tree removal policy set out herein.

B. A TREE MAY BE CONSIDERED FOR REMOVAL UNDER THE FOLLOWING CIRCUMSTANCES

1. When it is determined to be dead; or
2. When it is determined to be diseased beyond preservation, as evidenced by the lack of healthy, living foliage during the normal growing season; or
3. When its location, condition or deterioration constitutes a safety hazard; or
4. When its location effects the preservation and maintenance of adjacent buildings and unduly contributes to the deterioration of the building; or
5. When the tree is damaged from the elements or disease to the extent that its appearance is unduly affected; or
6. When its location is determined to be an obstruction and a hazard to utility lines; or
7. When its location unduly interferes with the construction of facilities and their site development; or
8. For any other appropriate, documented and informed reason.
9. Trees meeting any of the above circumstances shall be identified to the Grounds Manager and/or System Landscape Architect who will be responsible for providing a recommendation and documentation for removal of the tree(s).

C. TREE REMOVAL PROCEDURE

1. The Grounds Manager or project manager shall submit a written recommendation for the removal of a tree to the Executive Director of Facilities.
2. The recommendation shall identify the location, species and reason for removal.
3. The recommendation shall also indicate the plan for replacement trees, giving the location and species, or the reason if the planting of a replacement tree is not recommended.
4. For trees recommended for removal that meet the classification of a heritage tree or valuable tree as designated in the tree inventory, the Executive Director of Facilities will transmit the report to the Tree Advisory Committee. The Tree advisory committee shall provide a written notification to affected parties of the intent to remove heritage or valuable trees, and give the parties reasonable opportunities to provide comments. After the commenting period, the Tree Advisory Committee shall make a written recommendation to the President.
5. Written approval from the President is required for the removal of heritage or valuable trees.
6. The removal of dead, damaged, diseased or non-heritage/valuable trees and those presenting a safety hazard can be approved by the Executive Director of Facilities who will report such action to the Tree Advisory Committee.
7. It is recognized that there may be exceptions to this policy, as follows:
 - a. Emergencies where safety and preservation of facilities require immediate removal.
 - b. Replacement of newly planted trees which do not survive. Replacement will be made with similar species, size and shape.
 - c. Reports of removals under these exceptions shall be made to the Executive Director of Facilities.

D. TREE REPLACEMENT

1. When it is necessary to remove a tree replacement tree(s) of suitable size and species shall be planted according to the following guidelines:
 - a. Replacement tree values will be expressed in terms of caliper inches;
 - b. Heritage trees will be replaced with appropriate species at a three to one ratio (For example, a tree with a 24-inch diameter will require 72 caliper inches of appropriate replacement trees, which could be met by twelve trees of 6-inch caliper or eighteen trees of 4-inch caliper.). Replacement trees shall immediately be designated as valuable trees;
 - c. Valuable trees will be replaced with appropriate species at a one-to-one caliper ratio and replacement trees immediately designated as valuable trees;
 - d. Other trees of desirable species as specified in the University design guidelines at a one to one-half ratio (1/2 inch tree caliper will be planted for every one inch removed);
 - e. Secondary trees (less desirable trees not listed in design guidelines) at one to one-quarter ratio.
2. The location and species of the replacement tree shall be consistent with the master plan guidelines for the area and the University design guidelines concerning tree species.
3. Particular care shall be taken to avoid the planting of trees that would interfere with the Campus Master Plan, future designated building sites, current and projected utility locations and projected street developments.
4. Replacement trees will be inspected and reported on annually, and must be viable for minimum of five years or be replaced with a similar tree.

E. MASTER TREE PLAN

1. The Executive Director of Facilities shall develop a master tree inventory plan which shall show the location, species, health and size of existing trees and of new trees to be planted. The tree plan will be presented to the Tree Advisory Committee for approval. Facilities shall establish a budget for tree preservation, maintenance and replacement and through the Office of Development solicit gifts and memorials to fund this policy.

F. TREE ADVISORY COMMITTEE

1. The committee will be chaired by the Executive Director of Facilities and comprised of the following individuals and representatives from the following groups as appointed by the President:

Executive Director of Facilities
Grounds Manager
UNT System Landscape Architect
Faculty Representative from Biological Sciences
Member of the Sustainability Council
Student Representative nominated by SGA
Community Representative

The committee will meet at the call of the chair, but not less than quarterly. The Tree Advisory Committee will be responsible to assist in providing guidance for future planning, approval of a comprehensive campus master tree plan, education of the campus population as to the benefits of the campus trees, recommendations concerning the removal of trees, designation of trees as heritage or valuable and development of connectivity to the community. The committee will establish goals for increasing the number of trees on campus.

06.105 References and Cross-references.
None.

06.106 Forms and Tools. (optional)
None.

Approved:
Effective:
Revised:

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