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**Land and water resources track**

**Environmental planning and management track**

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Student Organizations

- National Association of Environmental Professionals
- Student Association of Spatial Scientists
- Student Chapter of the Association for Fire Ecology
- Student Society of Arboriculture
- SFA Biology Club
- SFA Student Chapter of The Wildlife Society
- Sylvans Forestry Club
- Student Chapter of the National Association of Interpretation
- The Environmental Awareness Movement (T.E.A.M)
- Student Organizations, Arthur Temple College of Forestry and Agriculture

Careers

- Josh Butler: Westward Environmental
- Charity Vaughn: Anadarko Petroleum Corporation
- Jeff Lamb: Luminant Mining Company
- Anthony Stambaugh: Texas Commission on Environmental Quality

Glossary

ATCOFA Organizational Chart
Modern society provides many economic and quality-of-life benefits for all of us. However, we also face difficult environmental challenges we must confront. Stephen F. Austin State University’s Division of Environmental Science is focused on producing graduates that are aware of these challenges and have the ability to develop cost-effective solutions. A Bachelor of Science in environmental science is the first step to being a part of the effort to address these issues.

SFA’s environmental science degree program is one of the first environmental science programs established in Texas. It gains much of its strength in the interdisciplinary nature of its curriculum, with foundational science courses from SFA’s College of Sciences and Mathematics and applied science courses from the Arthur Temple College of Forestry and Agriculture. At the graduate level, we also partner through curriculum and research with the University of Texas Health Science Center in Tyler, Texas, providing a unique human-health perspective not offered in many other environmental science programs.

The field of environmental science is satisfying, dynamic and challenging, and also provides excellent national and international career opportunities. The U.S. Bureau of Labor Statistics projects faster than average job growth in this profession with an increase of 15 percent during the current decade. Many of our students gain a head start on their professional career through part-time employment via faculty research projects and paid internships with private companies and government agencies. The program’s small class sizes also facilitate the development of meaningful, professional relationships with professors, enabling students to receive the most out of their education.

This curriculum guide will help you better understand SFA’s Bachelor of Science in environmental science degree program, which will help make the important decision on which college major to select. Feel free to contact me if you have any questions. I look forward to helping you meet your educational goals.

Dr. Kenneth Farrish, C.P.S.S.
Director, Division of Environmental Science
kfarrish@sfasu.edu • (936) 468-2475
# Degree Plan
## B.S. Environmental Science

### GENERAL EDUCATION REQUIREMENTS

**Communication Component Area (6)**
- ENG 131 or ENG 133H and select one from:
  - COM 111, 170 or 215

**Component Area Option (6)**
- ENG 132 and BCM 247 or ENG 273

**Mathematics Component Area (3)**
- MTH 138 or MTH 233

**Life and Physical Sciences (6)**
- CHE 133 (3) General Chemistry
- CHE 134 (3) General Chemistry

**Language, Philosophy and Culture (3)**
- Select one from: ENG 200, 209, 211, 212, 222, 229, 230 or 233H; HIS 151 or 152; PHI 153 or 233

**Creative Arts (3)**
- Select one from: ART 280, 281 or 282; DAN 140; MHL 245; MUS 140; THR 161 or 163

**American History (6)**
- HIS 133 and HIS 134

**Government and Political Science (6)**
- PSC 141 and PSC 142

**Social and Behavioral Sciences (3)**
- ECO 232

**REQUIRED (42)**

### LAND & WATER RESOURCES (EVSCLAWR)

- BIO 309 (4) Microbiology, BIO 450 Limnology or CHE 420 Environmental Chemistry
- CHE 231 (4) Quantitative Analysis
- GOL 131 (4) Introductory Geology

**Approved Electives (6)**

**REQUIRED (18)**

### ENV. PLANNING & MANAGEMENT (EVSCPAM)

- MGT 370 (3) Management Principles
- Approved Electives (15) to be used toward obtaining minor or second major

**REQUIRED (18)**

### MAJOR REQUIREMENTS

**BIO 131 (4) Principles of Botany**

**BIO 133 (4) Principles of Zoology**

**BIO 313 (3) General Ecology or ENV 209 Forest Ecology**

**BLW 478 (3) Environmental Regulatory Law**

**CHE 133L (1) Lab taken concurrent with lecture and fulfills major requirement**

**CHE 134L (1) Lab taken concurrent with lecture and fulfills major requirement**

**CHE 330 (4) Fundamentals of Organic Chemistry**

**ENV 110 (3) Intro. to Environmental Science**

**ENV 210 (3) Environmental Measurements**

**ENV 310 (3) Environmental Health & Safety**

**ENV 349 (3) Environmental Soil Science**

**ENV 402 (3) Wetland Delineation & Function**

**ENV 403 (3) Remediation & Reclamation of Disturbed Land**

**ENV 412 (3) Environmental Hydrology**

**ENV 415 (4) Environmental Assessment & Management**

**ENV 420 (3) Landscape Ecology & Planning**

**ENV 450 (3) Air Quality Assessment**

**FOR 457 (3) ENV Attitudes & Issues or ENV 348 Natural Resource Policy**

**ENV 470 (1) Senior Seminar**

**GIS 224 (3) Intro. to Spatial Science**

**GIS 390 (3) GIS in Natural Resources**

**REQUIRED (18)**

**TOTAL HOURS REQUIRED FOR DEGREE: 124**

*NOTE: It is the student’s responsibility to complete the degree requirements as specified. A Final Graduation Plan must be filed in the Dean’s office during the semester prior to graduation.  
(#): Number of credit hours per course.*
### Environmental Science Core Requirements

<table>
<thead>
<tr>
<th>COURSE #</th>
<th>COURSE TITLE</th>
<th>SEMESTER(S) OFFERED</th>
<th>PREREQUISITES</th>
<th>INSTRUCTOR</th>
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<tbody>
<tr>
<td>BIO 131</td>
<td>Principles of Botany</td>
<td>fall, spring, summer I</td>
<td>Appropriate entry test scores</td>
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<td>BIO 133</td>
<td>Principles of Zoology</td>
<td>fall, spring, summer I</td>
<td>Appropriate entry test scores</td>
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<td>BIO 313</td>
<td>General Ecology or</td>
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<td>BIO 131 &amp; 133</td>
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<td>Forest Ecology</td>
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<td>BLW 478</td>
<td>Environmental Regulatory Law</td>
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<td>Junior or Senior classification</td>
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<tr>
<td>CHE 133</td>
<td>General Chemistry I</td>
<td>fall and spring</td>
<td>MTH 138, 143 or minimum math score of 25 (ACT) or 580 (SAT)</td>
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<td>CHE 134</td>
<td>General Chemistry II</td>
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<td>ENV 210</td>
<td>Environmental Measurements</td>
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<td>ENV 110</td>
<td>Jerez</td>
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<tr>
<td>ENV 310</td>
<td>Environmental Health &amp; Safety</td>
<td>spring only</td>
<td>ENV 210 &amp; CHE 133</td>
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<tr>
<td>ENV 349</td>
<td>Environmental Soil Science</td>
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<td>Wetland Delineation &amp; Function</td>
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<td>ENV 349</td>
<td>H. Williams</td>
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<td>ENV 403</td>
<td>Remediation &amp; Reclamation of Disturbed Land</td>
<td>spring only</td>
<td>ENV 349</td>
<td>Farrish</td>
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<tr>
<td>ENV 412</td>
<td>Environmental Hydrology</td>
<td>fall only</td>
<td>ENV 349</td>
<td>McBroom</td>
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<td>ENV 415</td>
<td>Environmental Assessment &amp; Mgmt.</td>
<td>spring only</td>
<td>Senior classification or instructor permit</td>
<td>H. Williams</td>
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<tr>
<td>ENV 420</td>
<td>Landscape Ecology &amp; Planning</td>
<td>spring only</td>
<td>GIS 224 or AGM 325 &amp; BIO 313 or ENV 209</td>
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<tr>
<td>ENV 450</td>
<td>Air Quality Assessment</td>
<td>spring only</td>
<td>Junior or Senior classification</td>
<td>Jerez</td>
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<td>ENV 470</td>
<td>Senior Seminar</td>
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<td>Senior classification</td>
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<td>FOR 457/</td>
<td>Environmental Attitudes &amp; Issues or</td>
<td>spring only</td>
<td>None</td>
<td>TBD or Kronrad</td>
</tr>
<tr>
<td>ENV 348</td>
<td>Natural Resource Policy</td>
<td>spring only</td>
<td>None</td>
<td>Kronrad</td>
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<tr>
<td>GIS 224</td>
<td>Intro. to Spatial Science</td>
<td>fall and spring</td>
<td>MTH 138 or 233</td>
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<td>GIS 390</td>
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<td>GIS 224</td>
<td>Hung</td>
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<td>MTH 220</td>
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<td>fall and spring</td>
<td>Appropriate entry test scores</td>
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### Land and Water Resources Study Track

<table>
<thead>
<tr>
<th>COURSE #</th>
<th>COURSE TITLE</th>
<th>SEMESTER(S) OFFERED</th>
<th>PREREQUISITES</th>
<th>INSTRUCTOR</th>
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<tbody>
<tr>
<td>BIO 309</td>
<td>Microbiology or Limnology</td>
<td>spring only</td>
<td>BIO 130, 131, 133 &amp; CHE 133</td>
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<td>BIO 450</td>
<td>Microbiology or Limnology</td>
<td>spring only</td>
<td>BIO 131 &amp; BIO 133</td>
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<td>CHE 420</td>
<td>Environmental Chemistry</td>
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<td>CHE 231 &amp; CHE 330 or 331</td>
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<td>CHE 231</td>
<td>Quantitative Analysis</td>
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<td>“C” in CHE 134</td>
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<td>GOL 131</td>
<td>Introduction to Geology</td>
<td>fall and spring</td>
<td>None</td>
<td>TBA</td>
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<tr>
<td></td>
<td>6 hours Approved Electives</td>
<td>any semester</td>
<td>As required by courses</td>
<td>As listed per course</td>
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### Planning and Management Study Track

<table>
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<tr>
<th>COURSE #</th>
<th>COURSE TITLE</th>
<th>SEMESTER(S) OFFERED</th>
<th>PREREQUISITES</th>
<th>INSTRUCTOR</th>
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<tbody>
<tr>
<td>MGT 370</td>
<td>Management Principles</td>
<td>fall, spring, summer I &amp; II</td>
<td>Junior or Senior classification</td>
<td>Henderson, Scifres, Crocker or Ormsby</td>
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<tr>
<td></td>
<td>15 hours approved electives</td>
<td>any semester</td>
<td>As required by chosen courses</td>
<td>As listed per course</td>
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</tbody>
</table>
Freshman/Sophomore Years
Introduction to Environmental Science familiarizes students with the basic principles of environmental science—a dynamic, multidisciplinary field of study exploring the interaction of living and non-living mechanisms of the environment.

During this course, students discuss major environmental issues like climate change, ozone depletion, air and water pollution, loss of biodiversity and more. Scientific critical thinking skills also are honed through the examination of sources, assumptions, data and arguments related to these issues. Students learn the proper usage of a variety of instruments, including the colorimeter, conductivity meter, carbon dioxide sensor and dataloggers. Lab provides valuable first-hand experience in examining the effect of contaminants on plant growth, comparing water quality, measuring automobile emissions and energy usage, as well as comparing renewable energy technologies.

Through class field trips, students also are provided a behind-the-scenes look into municipal water resources and responsible waste management. The semester culminates in a presentation in which students research and present causes, effects and solutions to some of the world’s most pressing environmental concerns.

What advice would you give to incoming students?

“The classes build upon each other, so make sure you really understand the material being covered, as well as the proper writing formats for memos and technical reports.”

- Garrett Schroeder, senior
Principles of Botany provides students with an introduction to the field of botany and plant sciences. The semester focuses on the key unit of plant life: the cell. Particular emphasis is placed on plant-specific organelles, including an introduction to plant tissues. The basic morphology, anatomy and function of plant roots, stems and leaves also are explored. Of course, a botany class wouldn’t be complete without an exploration of plants’ physiological processes, including photosynthesis, the Calvin Cycle and variations of photosynthetic pathways. Students also gain an understanding of basic plant reproduction, gametangia, sporangia and specialized reproductive features.

Each of these focuses are applied to the five basic groups of land plants: bryophytes, lycophytes, ferns, gymnosperms and angiosperms. The lab focuses on material not covered in lecture, including basic skills in microscopy and production of temporary specimen mounts. The lab develops students’ skills of biological observation, training them to identify plant cell organelles, different cell types and tissues, as well as recognition of ecotypes by the adaptive histology of the leaf.

Why did you choose to study environmental science at SFA?

“I want to help create a sustainable environment for the future.”

- Kyle Jackson, senior
Introduction to Geology is designed to provide students with a basic understanding of geological principles, as well as the methods and technologies used in natural sciences.

Since the course is designed for individuals with no geological background, the class begins with an exploration of the discipline before progressing to mineralogy and rock classification. During lab and lecture, students differentiate the physical differences of the three primary rock types, as well as how the Earth’s processes contribute to their formation. To do so, students learn how to appropriately use tools such as hand lenses, glass plates and streak plates.

The course also explores glacial, eolian and coastal processes that shape the planet. In addition, the role of plate tectonics rock formation requires students to identify and assess the differences among competing scientific theories.

Furthermore, an exploration of rock porosity and permeability will increase student understanding of the global water concern and its critical role in society.

During lab and lecture, students differentiate the physical differences of three primary rock types, as well as how the Earth’s processes contribute to their formation.
BIO 133
Principles of Zoology

From embryology and evolution to habits and distribution, zoology is the branch of biology that pertains to the animal kingdom.

Principles of Zoology explores the fundamental theories of this field of study. Lecture provides an overview of the discipline before diving into the physiological components of animal life. Discussions of anatomical diversity among vertebrates and invertebrates, as well as the genetic and evolutionary mechanisms found throughout the kingdom provide a solid scientific foundation to expand one’s knowledge.

The lab portion of the course provides direct experience in the study of natural sciences. Lab examines the foraging and predator-prey relationship within the animal kingdom. Subsequent labs, including the cardiovascular and muscular system, phylogenetics and echinoderms, reinforce concepts introduced in lecture through hands-on experiments and study.

Students will be evaluated with weekly quizzes, lab reports and two scheduled exams covering multiple exercises.

What advice would you give to incoming freshmen?

“The tutors in the AARC have helped me greatly with my difficult classes. If you are ever unsure about anything, just ask. Everyone is so friendly, it’s impossible to not make friends.”

- Krista Rouse, senior

COURSE DESCRIPTION
Fundamental principles of animal life, including invertebrate and vertebrate animals.
This course provides students with an understanding of the basic concepts of chemistry.

Lecture emphasizes a key component of the chemistry field: the periodic table. Progressing through the semester, students will develop a vocabulary specific to the chemistry field, including nomenclature, notations for isotopes and classification of matter. Basic statistical methods such as significant figures, accuracy, precision and uncertainty in measurements will be covered. Emphasis is placed on nomenclature, as it is necessary in naming compounds or deriving a formula from a name.

Students enrolled in General Chemistry also must concurrently take a lab—CHE 133L. Lab covers basic laboratory techniques and employs them through experiments such as chromatography, identification of an unknown solid and endothermic and exothermic reactions. Lab notebooks are an important component of the course. With each experiment, students utilize lab notebooks to outline the purpose, procedures, calculations and conclusion of the experiment. This task ensures the proper execution of experiments and develops skills in scientific writing.

Student tip:
“Set aside time at the end of each week to go over the new material and you won’t be so overwhelmed.”

- Clay Rushing, junior
General Chemistry II delivers the general principles of inorganic chemistry and focuses on developing students’ ability to apply these principles to problem solving.

The course reviews key elements covered in CHE 133 before delving into new material, including reaction rates, reaction order, rate constant k units and first integrated rate law. CHE 134L, taken concurrently with the lecture, focuses on applying the principles learned in lecture to solve problems in a laboratory setting. Labs that cover volumetric analysis, kinetics and spectrophotometric analysis will develop the skills and confidence needed to perform standard experiments using contemporary instrumentation.

Students also maintain a lab notebook detailing experimental plans, procedures and conclusions for each experiment. The lab notebook provides students with a detailed account of each experiment and requires them to synthesize and convey their understanding of the investigation. This ability is key to the field of science.

What advice would you give to incoming freshmen?

“Participate in at least one group or organization every year. It provides you with great experience, and it looks good on résumés.”

- Megan McCombs, sophomore
The natural world is not linear, but cyclical. Forest Ecology provides students with insight into the forest cycle and introduces them to the impacts that soil, climate and living organisms have on plant growth. Students learn basic terms, concepts and skills that are necessary to becoming a successful environmental scientist. Major concepts explored include the abiotic variables of light, temperature and water on tree growth and survival, the basic life cycle of a tree and applied genetics.

During lab, students conduct assessments and measurements related to the concepts covered in lecture. Meeting with foresters from state agencies better help students understand how and why the implementation of best management practices is necessary to maintain site quality. Also, a visit to a local seed laboratory provides an in-depth look at how selective breeding is used to produce genetically superior trees for a working forest.

Through the variety of labs, students have many opportunities to view possible career paths in their future.

**COURSE DESCRIPTION**

Climatic, edaphic and biotic factors and their relation to woody growth.

**Student tip:**

“Start labs and lab reports early. Also, start studying early so you can go to office hours for clarity well before a test.”

- Michelle Zvonkovic, junior
Science demands precise methodology and measurements. Through this fall-only class, students learn the basics of sampling and measuring biological, chemical and physical parameters of atmospheric, aquatic and terrestrial systems.

Though all environmental compliance standards must be approved by the Environmental Protection Agency, they vary by state. Environmental Measurements explores these standards, as well as the historical events leading to the development of environmental science and its evolution as a professional field. Students learn to operate key tools for water, soil and air sampling such as the spectrophotometer, colorimeter, impactors, cyclones, and gas and vapor sample collectors.

Phase I Environmental Site Assessments also are a component of the class. During lab, students learn to analyze data using Microsoft Excel, prepare Quality Assurance/Quality Control samples and much more. Field trips to Ana-Lab Corporation in Kilgore and a former brownfield site, now home to the BBVA Compass Stadium in Houston take place.

A final group project requiring field and laboratory measurements will utilize this newly gained knowledge to address an environmental issue in the surrounding community.

What is your fondest memory from an environmental science class?

“In ENV 210, we got to do semester-long group research projects. So cool! We got to be environmental scientists. There’s nothing like application and experience.”

- Whitney Johnson, junior
The concepts and skills learned in Introduction to Probability and Statistics are key aspects of scientific investigation and your chosen field of study.

The course explores descriptive statistics used to analyze and describe data. This includes the graphical display of data, measures of location, as well as measures of dispersion. Students also learn about probability and sampling distributions before exploring the ways in which statistics allow scientists to make inferences about a population from sample data.

Upon completion of the class, students have the ability to apply statistical methods to modeling and solve real-world issues.

The course explores descriptive statistics used to analyze and describe data.
Introduction to Spatial Science familiarizes students with exciting, cutting-edge technology used in the field of natural resources. During this course, students learn to effectively use aerial photography, satellite imagery, global positioning systems and geographic information systems software. These concepts build a very strong foundation essential for later courses.

In lecture, GIS is emphasized as an important technological tool that links critical information to a location in order to understand spatial relationships. These concepts are then illustrated in contemporary examples such as city planning and environmental management.

Lab familiarizes students with the use of traditional tools such as stereoscopes, to analyze and interpret aerial photography, as well as color and color-infrared images. After learning more about the origins of spatial science, students transition to using GPS units and the most up-to-date versions of computer software, such as ArcMap and ERDAS, along with the latest satellite imagery.

The final project utilizes these new skills through the creation of a map that solves a natural resource management issue, demonstrating there is no limit to solving issues with this technology when there is a spatial component.

What are the benefits of being an environmental science student at SFA?

“Getting to use all of the equipment, seeing a lot of different industries and having professors with a lot of field experience.”

- Maura Roberto, senior

Students complete a final GIS project with real-world applications.
Quantitative Analysis seeks to advance students’ knowledge of chemistry’s fundamental concepts. The materials presented in the course provide a more comprehensive explanation of the basic concepts, laws and theories presented in general chemistry, as well as the application of this knowledge to solve advanced problems.

The course introduces students to the analysis of real samples, as well as the principles of experimental error in chemical analysis. Lecture also explores aqueous solutions and chemical equilibria, the effects of electrolytes on chemical equilibria and solving equilibrium calculations for complex systems.

Lab allows students to demonstrate these new skills and hone their problem solving abilities. Lab topics include the gravimetric analysis of a soluble salt, standardizing a strong base and the identification of a weak acid using molecular weight and the pKₐ.

This course will foster an appreciation for chemistry as it relates to the other disciplines, as well as the ways in which chemistry solves contemporary problems.
Did you know that humans carry far more bacterial cells than human cells? To say that there is more to our world than meets the eye is an understatement; microbiology explores this unseen world.

During this course, students learn to differentiate viruses, bacteria, fungi, algae and protozoans in terms of their structure, physiology, genetics, replication and reproduction, as well as their interactions with humans and the environment.

The course also focuses on how microorganisms grow, their nutritional requirements, and how antibiotics can control and target their cellular mechanisms and structures. Lecture addresses the mechanisms of prokaryotic DNA replication, nucleic acid transcription and translation, mutations and mobile genetic elements. Through lab students investigate concepts discussed in lecture and enhance their scientific writing skills through the completion of lab reports, homework and exams.

Examples of exercises conducted in lab include investigating the microbiology of pond water, testing for antibiotic sensitivity and analyzing the microbiology of alcohol fermentation.

To say that there is more to our world than meets the eye is an understatement; Microbiology explores this unseen world.
In addition to ecological protection, a key component of environmental science is safeguarding human health. Environmental Health and Safety familiarizes students with the agencies, principles and procedures that guide this mission.

The course explores the Environmental Protection Agency and Occupational Health and Safety Administration’s policies, procedures, training and inspection techniques. Subsequent lectures focus on hazardous waste handling, storage and disposal, with a special focus on the EPA’s Spill Prevention, Control, and Countermeasure Rule. This rule specifies the requirements for oil spill prevention and preparedness, as well as the response to oil discharges to navigable waters and adjoining shorelines. Students will use this knowledge to conduct an SPCC inspection and tour of SFA’s Uwaste facilities, which will provide valuable field-based experience.

Personal safety in the field also is underscored. Threats such as blood-borne pathogens, medical waste and specific occupational threat mitigation are covered thoroughly.

The knowledge and skills learned in this course provide you with the topic-specific concepts and applications needed for making tactical implementation decisions as an environmental professional.

What are the benefits of being an environmental science student at SFA?

“You spend a lot of time with good people and learn how to work with others. I also like being able to walk into any professor’s office and talk to them about anything.”

- Walker Lazo, senior
The concept of ecology can best be described in one word: relationships.

General Ecology explores the complex branch of biology that revolves around the relationship between organisms and their physical surroundings.

Lecture introduces the scientific method, a system that has personified scientific investigation since the 17th century. The course proceeds to examine climate systems, biomes, as well as evolution and adaptation. The theory of life history and life-history traits are examined, as is population distribution and abundance.

Population models drive much of our ecological understanding; thus, this course explores the science behind them. Lab provides a time to investigate the concepts covered in lecture, and the hands-on activities conducted augment understanding of complex subjects.
Organic chemistry is the study of carbon-based compounds. Beginning with electronic structure and configuration, students progress to basic organic nomenclature and other foundational principles.

Activities conducted in lab reflect the content discussed in lecture and provide a hands-on approach to exploring the material. During lab, students conduct experiments that range from acid-base extraction to the preparation of soap and aspirin. Supplementary readings guide these activities.

Students also maintain a lab notebook in which they record experiment procedures, data and observations. This strengthens scientific and observational skills and demonstrates full comprehension of the material covered.

At the end of this course, students will be able to apply essential chemical principles such as thermodynamics, kinetics and acid-base behavior to explain the chemical behavior and reactivity of organic compounds.

What class have you found to be the most challenging?

“I would say that chemistry is the most challenging, but also very fun. The key is and always will be to know nomenclature.”

- Brandon McBride, junior
No natural resource professional can truly appreciate their calling without exploring the origins of the profession. Natural Resource Policy immerses students in the history of forestry and the environmental movement in the United States through an in-depth look at the laws that govern natural resource management approaches.

Beginning with basic public land policy, the course outlines the evolution of regulation and public opinion of natural resources during the past two centuries, providing a better understanding of how the United States views land distribution. The course also investigates legislative history, citizen activism and the environmental movement, culminating with current issues affecting the environment.

A thorough understanding of how natural resource policies have developed throughout America’s history enables students to better appreciate current management approaches and policy in the modern world.

COURSE DESCRIPTION
Forest history and natural resource policy in the United States, including effects of the environmental movement.

What was your favorite class?

“Natural Resource Policy. This class gave me faith that the environment can be protected, and I began to see myself in a career in natural resources.”

- Jeremy Ayars, senior
Learning how soils are formed, as well as their physical, chemical and biological components, is key to understanding how they shape land use and the surrounding environment. Environmental Soil Science facilitates an understanding of this important ecological element – literally from the ground up!

In the classroom, students learn how micro-organisms, organic matter and nutrients affect soil productivity. Students also explore the chemistry of different soils and their effect on hydrologic cycles. These components help students understand how to address soil management problems.

Lab focuses on describing soils in the field and collecting soil samples to analyze in the laboratory for texture, bulk density, particle density, pore space and other parameters. During these outings, students observe and investigate some of the various soil types found in East Texas and learn their identifying characteristics by analyzing their layers for color, pH, texture and other properties.

Upon completion of this course, students have a solid understanding of how soils not only affect land, but also land management and environmental concerns.

COURSE DESCRIPTION
Physical, chemical and biological properties of soils.

How would you describe a typical class in the environmental science program?

“Class is highly dynamic. Lots of time is devoted to acquiring and building skills useful in the field.”

- Conner Marx, junior
Management Principles seeks to develop the management and leadership skills needed to ensure successful organizations. This course provides environmental science students with the professional tools needed for careers with consulting agencies, natural resource agencies and industry, as well as city, county or state government.

Material covered presents management as a discipline and a process. Through lecture and regularly assigned readings, students learn the basic management functions of planning, leading, organizing and governing.

The decision-making processes that accompany each of the areas also are a key focus of study. Organizations are complex and evolving systems. Thus, it is imperative that students understand their legal, social, internal and external environments. Human resource issues such as demographic diversity also are crucial to the development of successful management principles.

Contemporary issues involving international, small-business management and organizational culture in the current globalized environment are analyzed in depth.

At the completion of this course, students understand the challenges and techniques of successful management.

COURSE DESCRIPTION
Management philosophy, functions of management and behavioral approaches to management

Students will learn to approach management as a discipline and a process.
Geographic Information System is utilized in a wide array of disciplines. Its applications extend far beyond mapping and measurements to the investigation and solution of contemporary natural resource issues.

Lecture explores the history and provides an explanation of the elements of GIS, including the fundamental role played by computers. Students are provided with an overview of the ArcGIS system, which is used to collect, organize, manage, analyze and distribute geographic information. Methods of map projection and commonly used projected coordinate systems are covered prior to the exploration of the essential elements of a complete map. Lecture assignments are given throughout the semester and provide students with the practice and experience needed to develop their GIS skills.

Class lab guides students through the application of processes discussed in lecture. A final project requires students to synthesize the material learned over the semester into a final deliverable product that addresses a natural resource issue and augments professional speaking skills.

GIS applications extend far beyond mapping and measurements to the investigation and solution of contemporary natural resource issues.
Wetlands are diverse ecosystems protected by both state and federal regulations due to the numerous roles they play in sustaining environmental health.

The course presents a historical introduction to the regulations that protect our water and wetlands, most notably the Clean Water Act. After this foundation is established, students are immersed in the specific parameters of wetland identification and the ecological principles on which the parameters and indicators are based. The Atlantic and Gulf Coastal Plain regional supplement to the U.S. Army Corps of Engineers Wetlands Delineation Manual serves as the guiding document for the delineation process.

Through lab, students implement the field methods covered in lecture. This includes identifying potential jurisdictional wetlands, delineating wetland boundaries, data collection, map making and the creation of formal reports. After reviewing identification and delineation procedures, students are introduced to rapid techniques that assess the ecological functional condition of the wetlands identified.

The techniques learned and applied in lab are used on a daily basis by state and federal agencies, private industry and private consultants.
The Environmental Protection Agency estimates there are more than 450,000 brownfields in the United States. Through case studies and research reports, this advanced-level course will explore and provide insight into the theory and practice of remediating and reclaiming these sites, as well as the landscapes that have been altered through resource development and extraction.

This spring-only colloquium-style class requires in depth student participation in the form of presentations and discussions. Each student will conduct a presentation and facilitate a class discussion related to an aspect of remediation or reclamation. Two mini-laboratory research projects also are conducted during the semester. One project will place emphasis on vegetative reclamation of degraded land, while the other involves bioremediation of petroleum-contaminated soils.

Field trips to remediated and reclaimed sites will supplement coursework, providing students with a valuable opportunity to view firsthand the techniques discussed during lecture and lab.

What was your favorite class?

“Remediation and reclamation. It was simply the most interesting. I had never thought of things like phytoremediation, and I also enjoyed the field trips.”

- Garrett Schroeder, senior
Water is one of our most vital natural resources. Environmental Hydrology allows students to explore the functions, properties and significance of water. The primary topics covered by this course include the effects of land use on water resources, basic hydrologic principles and ways to minimize human impacts on water resources.

Taking what was learned in lecture to the waterways of East Texas, students are introduced to equipment used to conduct basic water quantity and quality measurements, including electromagnetic flow meters, which measure stream velocity, and water quality probes, which measure dissolved oxygen, conductivity, pH, temperature and turbidity. Students also learn Environmental Protection Agency-approved water sampling techniques and aquatic biota collection methods. After honing these skills, students gain valuable experience by collecting measurements at a project site to determine whether or not the site meets water quality standards required by law. This is an essential skill that will be drawn from in future courses and careers.

This course affords students with an understanding of how to meet society’s needs while conserving water resources.

What would you like to do with your environmental science degree?

“I would like to work with marine biologists to study the human impact on aquatic endangered species.”

- Clay Rushing, junior
The adoption of the National Environmental Policy Act had such far-reaching implications in the realm of environmental law that it is often referred to as the ‘Magna Carta of environmental law.’ The primary effect of the legislation was the requirement of federal agencies to consider the environmental ramifications of proposed actions, as well as provide alternatives to those actions. To meet this requirement, agencies must prepare Environmental Impact Statements.

This course tasks students with the creation of this vital environmental document. At the beginning of the semester, groups collect information required for the data portion of the group’s project document. Once the data is collected, each student prepares their own EIS, which requires the utilization of some or all of the skills developed in past courses. This is an essential document in the student’s chosen field of study; therefore, thoroughness of content and professional presentation will be a major consideration in determining the final grade.

Each student will prepare their own environmental impact statement, requiring the utilization of some or all of the skills developed in past courses.
This course is designed to develop students’ working knowledge of the basic principles and concepts of environmental chemistry, including the applications of modern analytical and chemical techniques for measuring and controlling contaminants.

This course provides environmental science students with the fundamental chemistry of environmental assessments, as well as its application in everyday situations faced by environmental professionals. Topics include equilibrium, oxidation-reduction reactions, kinetics, solubility, acid-base chemistry and thermodynamics to complex environmental processes.

Lecture subjects include the origin of the atmosphere and early weathering processes, as well as biogeochemical cycles, nuclear fusion and microbial degradation of pesticides.

In addition to discussions of man’s influence on the environment, students will study the chemical methods used to monitor, control and study those impacts. The statistical models needed to establish adequate criteria for the analytical methods also are discussed. Field and laboratory exercises that build upon material covered in foundational courses will be carried out during the semester.

This course provides students with the fundamental chemistry of environmental assessments and its application in situations faced by environmental professionals.
From its origins in 1930s Europe, landscape ecology has sought to explore the ways in which the composition and arrangement of habitat, landforms and land use influence ecosystem processes. Consider the impact of a mountain range or secluded island on the surrounding environment. Those influences are analogous to those of our ever-expanding cities.

This spring-only course examines the principles of landscape ecology as they relate to both natural and anthropogenic disturbances. In lecture and lab, students explore the divisions of landscapes and the mosaics defined by the elements of patches and corridors. Students will survey the landscape ecology of the SFA campus, as well as landscape processes in Nacogdoches County. Labs conducted at SFA provide opportunities to examine patch ecology and landscape corridors located on campus. Through an understanding of landscape ecology, students also will cultivate a philosophy of landscape management.

**Student tip:**

“I would recommend going to every meeting or opportunity for internships, and keep an updated résumé prepared at all times.”

- Jared Erwin, sophomore
Limnology is the study of the biological, chemical, physical and geological properties of inland waters. Through this course, students learn more about the physical and chemical properties of water and the morphometry of lakes and river systems. Furthermore, students gain an understanding of the diversity, population dynamics and ecology of the aquatic organisms inhabiting a variety of aquatic inland environments. The course also investigates how these organism communities interact and the manner in which those interactions influence the ecology of the ecosystem.

Human impact on aquatic systems is an important component of the course, as are the conservation initiatives in place to protect these environments.

During the course, students learn and employ field techniques to measure water transparency and sample and identify invertebrates. Specific lab techniques used to measure important parameters such as dissolved oxygen, pH, turbidity and conductivity also are covered.

These techniques will be used throughout students’ future careers as environmental scientists.

What are the benefits of being an environmental science student at SFA?

“You get a taste of all the disciplines involved in the field of environmental science.”

- Elena Thomas, senior
You’ve heard about ammonia, methane, volatile organic compounds and particulates, but how are these compounds monitored and tested? Air Quality Assessment explores the basic concepts, techniques, methodologies and practices related to assessing our air quality.

Lectures and discussions are divided into three categories: air monitoring, modeling, and control and management. Within each of these categories, specific aspects will be emphasized. Students learn how to use AERMOD, an atmospheric dispersion modeling system widely used in air permitting. Students also explore how the source, its location and characteristics, weather, terrain and atmospheric chemistry affect pollutant distribution, dispersion, and thus, the surrounding community.

Field trips allow students to see these applications in action. At Martin Lake Steam Electric Station, a coal-fired power plant, and Aspen Power Plant, a biomass-fired power plant, students observe the instrumentation used for monitoring, as well as some of the control technologies used for removing pollutants from their emissions.

A group project requires the completion of an air quality assessment report for one of Texas’ metropolitan areas.

What advice would you give students taking this class?

“I would advise students to spend additional time outside of class familiarizing themselves with AERMOD.”

- Kristen Green, senior
In order to successfully communicate the significance of environmental issues, one must first understand the science and, perhaps more importantly, the socio-political nuances that accompany them. This spring-only course focuses on what is possibly one of the most pressing issues of this generation: climate change.

Students are introduced to the basics of the climate system, anthropogenic and natural sources of change, as well as climate models. Furthermore, the socio-economic ramifications of climate change, as well as the psychology and politics driving the climate change debate are analyzed. Weekly discussions regarding assigned readings and TED Talks hone critical communication skills and provide students with the techniques needed to effectively and responsibly communicate scientific issues to the public.

A crucial conversations journal tasks students with engaging those around them in climate-change related conversations. Through a final oral project, students develop an explanatory position statement and illustrated talk describing their understanding and commitments related to climate science, communication and environmental sustainability.

What is your most meaningful memory from a class in the college?

“In FOR 457, we set up a booth to inform the general public about climate change. Also, the course was very discussion oriented and fun.”

- Chance Collins, senior
Presenting scientific information to peers and the public is a critical aspect of the environmental science profession.
From the Endangered Species Act to the Energy Independence and Security Act, our nation has a storied history of legislation dedicated to conserving and protecting the health of its citizens and natural resources. Environmental Regulatory Law examines past and current environmental regulation, including those that define acceptable use and protection of natural resources by businesses and industry.

The course provides an overview of the study of law, as well as the differing philosophies in environmental regulation. The course also provides an understanding of the administrative agencies and courts involved in environmental law, as well as the intersection of our nation’s Constitution and environmental regulation. In addition, the course explores water rights and ownership, an extremely important topic in Texas and across the globe.

Students learn about important legislation such as the Comprehensive Environmental Response, Compensation and Liability Act, Emergency Planning and Community Right-to-Know Act, and the Toxic Substances and Control Act.

Our nation has a storied history of legislation dedicated to conserving and protecting the health of its citizens and natural resources.
Student organizations are a great way to make friends, develop leadership skills and professionally network within your field of interest. Our organizations are extremely involved in numerous volunteer projects in the community and at SFA, providing students with a wealth of beneficial experiences to foster both professional and personal growth.
The National Association of Environmental Professionals is a multi-disciplinary association for professionals dedicated to the advancement of environmental professions. The organization serves as a forum for environmental planning, research and management, as well as a network of professional contacts and resources for career development. NAEP is a strong proponent of ethics and the highest standards of practice in environmental professions.

SFA’s chapter of the NAEP hosts a yearly symposium, which addresses current environmental issues such as water quality and availability and invasive species. These forums are dedicated to educating the public on pressing environmental issues and bring together an array of experts to discuss research and potential solutions to the problems that effect the global community.

Members take time to enjoy the outdoors through social events such as camping and kayak trips. With NAEP membership comes opportunities for outreach, professional development, professional networking, as well as lasting friendships.

Adviser: Dr. Kenneth Farrish
kfarrish@sfasu.edu
Student Association of Spatial Scientists

The Student Association of Spatial Scientists is an organization that focuses on advancing the knowledge of SFA students who are interested in spatial science. Its goal is to promote awareness of the academic program of spatial science in the Arthur Temple College of Forestry and Agriculture, as well as its related technologies and career opportunities.

The organization also offers social activities and events that provide opportunities for the members to gain leadership skills and professional development. SASS welcomes students from all disciplines across campus. The organization invites guest speakers, from a variety of professions, to inform students of the current status of spatial technologies and provide advice for their future careers. Members also are available to assist students with GIS tasks and provide tips and tricks on software applications.

SASS helps organize the annual GIS Day event, held the third Wednesday of November. The university celebrates GIS Day through a series of presentations showcasing the use of GIS and nurturing our GIS community. SASS members are integral to this event, and we hope you can join us. Adviser: Dr. I-Kuai Hung; hungi@sfasu.edu.

Student Chapter of the Association for Fire Ecology

The Student Chapter of the Association for Fire Ecology exists to provide students with hands-on experience with prescribed burning and opportunities to work with professionals in the field.

Members of SAFE have the opportunity to become Red Card Certified, receiving training in fire behavior, safety, equipment, radio communications and chain of command in the U.S. Forest Service (which also applies to other federal land management agencies) needed to successfully participate in a prescribed burn. Students help burn in the spring and have experience working with a government agency.

SAFE volunteers within the community and at many festivals and other events, providing outreach and education on the importance of fire safety and the role of fire in many ecosystems. One of their recent accomplishments includes making the SFA campus a Firewise Community, which is a national effort to protect people and property from the risk of wildfires. SAFE is a fun way to get involved with the public, network with professionals and gain valuable skills! Adviser: Dr. Brian Oswald; boswald@sfasu.edu.
Student Society of Arboriculture

The Student Society of Arboriculture serves as a link between professionals in the tree care and “green” industries and students. SSA is comprised of both forestry and horticulture students.

Members of SSA stay current on information and trends in the commercial tree care industry, have membership in the International Society of Arboriculture, have connections to employers across the nation, and have access to internships that boost their résumé and job-related skills.

SSA volunteers across the SFA campus and in the local community. Their newest project is to conduct and coordinate the “Adopt-A-Tree Program” on the SFA campus. Adopt-A-Tree is an urban shade tree program designed to plant new trees in urban areas and maintain existing shade trees. SSA also attends the Texas Tree Conference every year, which is hosted by the Texas Chapter of the International Society of Arboriculture. At the conference, students have the ability to network with professionals in their field and learn the latest tree care and urban forestry news and information. Membership in SSA allows students to not only get a leg up in the arboriculture industry, but also create lasting connections with fellow students. Adviser: Dr. Hans Williams; hwilliams@sfasu.edu.

SFA Biology Club

Since 1948, the SFA Biology Club has provided interested students in biological sciences with the opportunity to socialize, network and gain valuable experience in the field.

Students participate in community events such as the Ellen Trout Zoo Bears, Blooms and Butterflies Earth Day celebration, as well as other events on the SFA campus. Adviser: Dr. Gene A. Sullivan; gsullivan@sfasu.edu.
SFA Student Chapter of The Wildlife Society

SFA’s student chapter of The Wildlife Society exposes students to sound stewardship methods of wildlife resources and the environment; allows them to take an active role in preventing human-induced environmental degradation; increases awareness and appreciation of wildlife values; and seeks the highest standards in all activities of the wildlife profession.

Students volunteer at events, which enhance their knowledge of current topics and issues in wildlife management and allows them to reach out to the public. Some of the events include the JAKES (Juniors Acquiring Knowledge, Ethics and Sportsmanship) event and the Wheelin’ Sportsmen event, both hosted by the National Wild Turkey Federation; the fundraising banquet for Safari Club International; and hunter check stations for the U.S. Forest Service.

Our student chapter also attends the annual meeting for the Texas Chapter of The Wildlife Society. The Wildlife Society is a great way to explore the professional world of wildlife management. Adviser: Dr. Chris Comer; commerce@sfasu.edu.

Sylvans Forestry Club

Sylvans Forestry Club is a social and service organization in the Arthur Temple College of Forestry and Agriculture. Sylvans is the face of forestry at SFA. They volunteer at numerous community events, participate in spirit programs at SFA, and place every year at the Association of Southern Forestry Clubs Conclave event.

Sylvans have a close relationship with the Texas Forestry Museum and volunteer at many of their community and fundraising events, including the Gala Dinner, Texas Forest Festival and Lumberjack Challenge. Sylvans also participate in spirit activities at SFA. During homecoming, the club holds an annual Lumberjack Day and builds a float for the homecoming parade.

The Sylvans’ biggest event is the ASFC Conclave, where they compete against all southern division forestry schools in events such as the men’s and women’s crosscut and bow saw, pole climb, birling, axe and knife throw, wildlife identification, timber estimation, compass and pacing, and many others. They have placed in the top three every year for the last 12 years. Adviser: Dr. Jeremy Stovall; stovalljp@sfasu.edu.
The Student Chapter of the National Association for Interpretation aims to connect students with professionals and hone their skills in environmental, cultural and historical interpretation.

In the fall, members attend the NAI National Convention, and in the spring, they attend the multi-state Region 6 Conference. At these conventions, members participate in training seminars where they gain skills important to recreation management. Students also network with interpretation professionals from around the United States. NAI is a great way for all students to get experience and make connections that can carry on past graduation.

NAI is involved in volunteer activities that better the community, which provide members with valuable hands-on interpretation experience.

Interpretation allows members to teach others about resources, which is a valuable skill for everyone. NAI is open to all majors. Adviser: Dr. Shelby Laird; lairdsg@sfasu.edu.

The Environmental Awareness Movement (T.E.A.M.)

The Environmental Awareness Movement, or T.E.A.M., strives to promote sustainability on the SFA campus and within the Nacogdoches community through action and public education.

Throughout the semester, T.E.A.M. hosts a number of events, including Recycle Days and free movie nights featuring environmentally conscious films. T.E.A.M. also participates in Recyclemania, a national competition and evaluation tool for college and university recycling programs to promote waste reduction activities on their campus communities. The organization also is responsible for the recycling bins located throughout campus, thanks to a partnership with the SFA Physical Plant.

T.E.A.M. also participates in National Campus Sustainability Day, which includes live music, informational booths and panel discussions led by professors, students and community members. In 2014, T.E.A.M. was awarded the Keep Nacogdoches Beautiful Partners in Sustainability Award in recognition of their outstanding environmental stewardship. Adviser: Jennifer Crenshaw; jmcrenshaw@sfasu.edu.
Ag Tech Club

The Ag Tech Club is open to anyone interested in agricultural mechanics and machinery. Events include the National Agricultural Mechanics Career Development Event in Indianapolis, Indiana, every fall. In the spring, the club participates in the Tri-County Tractor Contest and hosts FFA career development events for high school students. Adviser: Dr. Craig Morton; mortoncraig@sfasu.edu.

Alpha Gamma Rho

The purpose of Alpha Gamma Rho is to “make better men.” A 2.0 GPA is required, and you must be enrolled in at least six hours each semester at SFA. Alpha Gamma Rho has programs to help the March of Dimes, Women’s Shelter and Nacogdoches Police Department. Adviser: Dr. John Mehaffey; mehaffeyjm@sfasu.edu.

Collegiate FFA

The mission of the Collegiate Future Farmers of America is to make a positive difference in the lives of students by developing their potential for premier leadership, cooperation and citizenship, personal growth and career success through agricultural education. Adviser: Dr. Dale Perritt; dperrit@sfasu.edu.

Agri-Ambassadors

Agri-Ambassadors are a group of students that recruit for the Department of Agriculture throughout the year at local events, national and statewide conventions, fairs and other exhibitions. To become a member of the organization, a student must maintain a 2.25 GPA and show an interest in exhibiting leadership skills through recruiting efforts. Applications are available in the main office of the Agriculture Building, Room 101, and must be returned to adviser, Emily Payne, in Ag 116A; epayne@sfasu.edu.

Delta Tau Alpha

Delta Tau Alpha is a national agricultural honor society that recognizes students for superior academic performance and dedication to the prosperity, health and well-being of the agricultural industry. Adviser: Dr. Leland Thompson; lthompson@sfasu.edu.

Rodeo Club

The SFA Rodeo Club is recognized by the SFA Recreation Center. Members of the Rodeo Club compete in collegiate competitions. Contact: RodeoSFASU@yahoo.com

Horticulture Club

The Horticulture Club is known for going on great trips, visiting exciting places and learning the tips and tricks of 21st century horticulture. The club meets once a week to assist the SFA Mast Arboretum in the propagation of plants for the Arboretum and Horticulture Club plant sales. The SFA Horticulture Club participates in the annual J. Benton Storey Undergraduate Student Horticulture Judging Contest. Adviser: Dr. Jared Barnes; barnesj@sfasu.edu.

Poultry Science Club

Poultry Science Club encourages and promotes interest in poultry science. It establishes relationships between the club and poultry judging contests for the youth in the state of Texas. The club also participates in community service programs. Adviser: Dr. Joey Bray; jbray@sfasu.edu.

Pre-Veterinary Medical Organization

The Pre-Veterinary Medical Organization is a professional organization whose purpose is to stimulate student interest in veterinary medicine, familiarize students with the expectations associated with pre-veterinary and the veterinary profession, and to build strong friendships among students. Adviser: Dr. Joey Bray; jbray@sfasu.edu.

Sigma Alpha Professional Agricultural Society

Sigma Alpha promotes women in agriculture and strengthens the bonds of friendship among them. Members strive for achievement in scholarship, leadership and service. Adviser: Emily Payne; epayne@sfasu.edu.

Show Team

The SFA Show Team encourages and promotes interest in showing livestock and increasing relations with the livestock industry. The team supports the collegiate livestock judging team and the FFA invitational livestock judging contest held on the campus each spring. Adviser: Dr. Erin Brown; browneg@sfasu.edu.

Other Student Organizations

Arthur Temple College of Forestry and Agriculture, 2016
Our alumni are employed by a variety of sectors, from private consulting firms and government agencies to global companies. We maintain meaningful relationships with many of our alumni and take great pride in learning about the ways in which they are advancing their careers through environmental stewardship.
Josh Butler
Environmental Specialist and Manager
Westward Environmental

Josh Butler, 2011 graduate of the environmental science program, is an environmental specialist and manager for Westward Environmental’s Dallas office.

In his position, Butler’s duties range from project coordination and research to on-site compliance testing and compliance audits. He works directly with clients to discuss permitting options and answers questions related to regulatory compliance.

“I believe that by obtaining the necessary permit authorizations associated with a client’s project and training our clients on the steps necessary to remain in compliance, we are able to preserve the industries that our quality of life depends on while respecting the environment in which we live,” Butler said.

Butler said he grew up with a love for the outdoors, and after taking introduction to environmental science, knew the program was a great fit.

He said he continues to use many of the skills and information covered in GIS, hydrology, soils and environmental measurements classes at SFA.

Furthermore, he advises students to learn and contribute to projects outside of their job description.

“Whatever you do, give at least 10 percent more effort than what is required,” he said. “This investment of your time will go a long way.”

Charity Vaughn
HSE Representative II
Anadarko Petroleum Corporation

Charity Vaughn graduated with a Bachelor of Science in environmental science in 2009. She currently works as a health, safety and environment Representative II for Anadarko Petroleum Corporation in Bryan, Texas.

Vaughn said she initially began college as a wildlife management major, but transferred to the environmental science program after gaining a better understanding of her future goals in natural resource protection.

“I loved the professors and coursework, and I made lifelong friends,” Vaughn said.

While Vaughn said many experiences during her time at SFA led her to her current career, the most valuable experience was working as an undergraduate assistant for Dr. Kenneth Farrish. Through Farrish, Vaughn was recommended for an internship with the company where she now works.

“Fast forward five years, and I’m still there. I went from intern, to contractor, to employee,” she said. “Don’t underestimate the connections you make in your undergraduate years.”

Vaughn says her career is extremely dynamic, and she is happy to be a part of ensuring that the public has access to petroleum resources in an environmentally responsible way.
Jeff Lamb
Environmental Specialist
Luminant Mining Company

Jeff Lamb graduated from SFA’s environmental science program in 2012 and works as an environmental specialist for Luminant Mining Company. Lamb decided to pursue a degree in environmental science after working for many years as a plumbing contractor that specialized in new construction.

“I wanted to find something that afforded me the opportunity to split my time between field and office work while providing a fresh, yet technical challenge I could be proud of,” he said. “Environmental Science fit that bill perfectly.”

Lamb’s workday typically begins with coffee and discussing work logistics with contractors before heading out into the field. In the field, he oversees the work of multiple contractors focused on numerous projects, including revegetation/reforestation, erosion repair, sediment control, water quality treatment, wildlife damage control, soil sampling and more.

He also spends time addressing and researching various regulatory requirements and developing GIS maps, one of his favorite aspects of the job.

Lamb encourages people to realize that it is never too late to change your life or career. Through his career change, he is now able to impact the world around him by protecting natural resources and ensuring Luminant remains in business and provide jobs.

Anthony Stambaugh
Rio Grande Watermaster
Texas Commission on Environmental Quality

Anthony Stambaugh is a 2014 graduate of SFA’s environmental science program and currently works as the Rio Grande watermaster specialist for the Texas Commission on Environmental Quality.

In this position, Stambaugh focuses on river operations. This includes receiving water requests from diverters such as farmers, industries and municipalities, and requesting water releases from applicable dams in accordance with the Texas Administrative Code and Texas Water Code.

Stambaugh, who also minored in biology while at SFA, began as an intern with TCEQ before moving into a full-time position with the agency. Through his regulatory role with the agency, he directly interacts with stakeholders who have questions regarding Texas water laws.

“If someone is looking to go into the regulatory industry, I highly recommend you familiarize yourself with the myriad of laws and regulations out there,” he said.

He also encourages students to focus on professional and personal development throughout college.

“Take every opportunity to better yourself as a professional individual, and always challenge yourself to work on areas you are not comfortable or confident in,” he said. “It will pay off in the long run.”
Abiotic: Not associated with or derived from living organisms.

Angiosperms: Taxonomic class of plants in which the mature seed is surrounded by the ovule.

Anthropogenic: Of, or related to, the influence of humans.

Aquatic biota: The plants and animals living in water.

Aqueous solutions: A solution in which the solvent is water.

Biomes: A major geographic region, typically defined by vegetation, that contains a distinct community of flora and fauna.

Bioremediation: The use of biological agents, such as bacteria, fungi or green plants, to remove or neutralize contaminants.

Brownfield site: Land previously used for industrial or commercial uses that has been or is believed to be contaminated with hazardous substances or pollution.

Bryophytes: A member of the group of photosynthetic, nonvascular plants that reproduce by spores.

Calvin cycle: The set of chemical reactions that take place in chloroplasts during photosynthesis.

Carbon dioxide sensor: A device that measures the presence and concentration of carbon dioxide gas.

Chemical equilibria: The point at which the concentrations of reactants and products do not change with time.

Chromatography: A set of techniques used to separate organic and inorganic compounds for study.

Colorimeter: A device that measures the absorbance of particular light wavelengths by a specific solution.

Conductivity: The degree to which a material conducts electricity.

Conductivity meter: A device that measures the electrical conductivity of a solution.

Cyclones: An air sampling tool that collects particulate matter capable of being respirated into filters for analysis.

Dataloggers: Electronic devices that record data over a period of time.

Delineation: See wetland delineation.

Echinoderm: A marine invertebrate of the phylum Echinodermata that has a radiating pattern of body parts and calcium-hardened body wall.

Eolian: Relating to, caused by or deposited by the wind.

Gametangia: An organ or cell in which gametes are produced.

Gymnosperms: A vascular plant having seeds not enclosed in an ovary. The term translates to ‘naked seed.’
Histology: The study of microscopic plant and animal cells.

Hydrologic cycle: The natural process by which water passes into the atmosphere as water vapor, precipitates to the ground as a liquid or solid, and once again returns to the atmosphere through evaporation.

Impactors: A tool used for monitoring microbiological air quality.

Kinetics: The study of chemical reaction speeds and the factors that affect this speed.

Lycophytes: Spore-bearing, seedless vascular plants.

Mineralogy: The aspect of geology specializing in the chemical, structural and physical properties of minerals.

Morphology: The branch of biology concerned with the analysis of the form and structure of organisms.

Nomenclature: The set of rules for generating the names of chemical compounds.

Organelles: A specialized part of a cell having a particular function.

Phase I Environmental Site Assessment: A report prepared for property holders that identifies potential or existing environmental contamination liabilities; considered as the first step in environmental due diligence.

Photosynthesis: The process through which green plants use sunlight to synthesize foods from carbon dioxide and water.

Phylogenetics: The branch of biology focused on reconstructing evolutionary history and studying the patterns of relationships among organisms.

Physiological: The ways in which living things and their parts function.

PKA: A quantitative measure of the strength of an acid in solution.

Prokaryotic: Micro-organisms that do not contain a distinct nucleus or membrane-bound organelles.

Protozoan: A single celled eukaryotic organism.

Quality Assurance/Quality Control (QA/QC) Samples: Quality control is a system of steps to assess and maintain the quality of the inventory or data being compiled, while quality assurance is a planned system of review procedures conducted outside the actual inventory compilation by non-biased personnel not directly involved in the inventory process.

Spectrophotometer: An instrument which measures the amount of light of a specific wavelength that passes through a medium.

Sporangia: An enclosure in which spores are produced.

Stereoscopes: A device through which two photographs of an object taken at slightly different angles are viewed together, creating a three-dimensional image.

Thermodynamics: The branch of science devoted to the study of heat and related phenomena.

Turbidity: The measure of relative clarity of a liquid.

Wetland delineation: The establishment of the physical location and size of a wetland for the purposes of federal, state and local regulations.
University Mission Statement:
Stephen F. Austin State University is a comprehensive institution dedicated to excellence in teaching, research, scholarship, creative work, and service. Through the personal attention of our faculty and staff, we engage our students in a learner-centered environment and offer opportunities to prepare for the challenges of living in the global community.

College Mission Statement:
The Arthur Temple College of Forestry and Agriculture will:
- maintain excellence in teaching, research and outreach;
- enhance the health and vitality of the environment through sustainable management, conservation, and protection of our forests and natural resources; and
- enhance the production and economic viability of agricultural commodities.
The mission of the Arthur Temple College of Forestry and Agriculture is to:
- maintain excellence in teaching, research and outreach;
- enhance the health and vitality of the environment through sustainable management, conservation, and protection of forests and natural resources; and
- enhance the production and economic viability of agricultural commodities.
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