

ENVIRONMENTAL SCIENCE

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The Environmental Science Program at SMSU was developed with three goals in mind: first, to prepare students for a variety of career opportunities in the environmental field; second, to provide students with basic skills and knowledge needed for advanced study in professional or graduate school; and third, to promote an appreciation and understanding of the natural world. To meet these goals, the Environmental Science Program offers a diversified selection of courses in the biological, chemical, and physical sciences. Supporting courses in biology, chemistry and geology are an important part of this curriculum in that they provide additional skills and knowledge required of environmental scientists.

Bachelor of Science: Environmental Science, Natural Science Option (72-75 credits)

The Natural Science option has a strong life science component and was designed to prepare students for employment by environmental consulting firms, environmental education centers, or government agencies. This option also prepares students for graduate study and research.

I. Core Requirements: (62-63 credits)

| | | |
|----------|---|---|
| BIOL 200 | Cell Biology (Lecture/Lab:3/1) | 4 |
| BIOL 301 | Zoology (Lecture/Lab:3/1) | 4 |
| BIOL 302 | Botany (Lecture/Lab:3/1) | 4 |
| BIOL 311 | Ecology (Lecture/Lab:3/1) | 4 |
| CHEM 231 | General Chemistry I (Lecture/Lab:3/1) | 4 |
| CHEM 232 | General Chemistry II (Lecture/Lab:3/2) | 5 |
| ENG 360 | Scientific and Technical Writing | 3 |
| ENVS 101 | Physical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 102 | Historical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 180 | Introduction to Environmental Science (Lecture/Lab:3/1) | 4 |
| ENVS 251 | Basic Soil Science (Lecture/Lab:3/1) | 4 |
| ENVS 390 | Research Methods in Environmental Science | 1 |
| ENVS 400 | Environmental Data Analysis and Presentation (Capstone) | 1 |
| MATH 140 | Calculus: A Short Course | 3 |
| | OR | 3 |
| MATH 200 | Statistics * | 3 |
| PHIL 107 | Environmental Ethics | 3 |
| PHYS 141 | College Physics I (Lecture/Lab:3/1) | 4 |
| PHYS 142 | College Physics II (Lecture/Lab:3/1) | 4 |
| ENVS 107 | Introduction to ArcGIS | 2 |

* May substitute other statistics course with program approval

II. Restricted Electives:* (10-12 credits)

Take at least ONE course from each group (A-C); at least ONE must include a laboratory:

Group A. Physical Science

| | | |
|----------|---|---|
| CHEM 244 | Instrumental Analysis | 4 |
| ENVS 221 | Meteorology | 3 |
| ENVS 302 | Geomorphology | 3 |
| ENVS 310 | Hydrology (Lecture/Lab:3/1) | 4 |
| ENVS 311 | Environmental Geology | 3 |
| ENVS 352 | Plant Nutrients in the Environment | 3 |
| ENVS 426 | Soil Morphology and Genesis (Lecture/Lab:3/1) | 4 |
| ENVS 450 | Environmental Instrumentation and Analysis | 3 |

Group B. Life Science

| | | |
|----------|--|---|
| BIOL 303 | Microbiology (Lecture/Lab:3/1) | 4 |
| BIOL 310 | Natural History of the Vertebrates (Lecture/Lab:3/1) | 4 |
| BIOL 321 | Genetics (Lecture/Lab:3/1) | 4 |
| BIOL 338 | Plant Diversity (Lecture/Lab:3/1) | 4 |
| BIOL 355 | Plant Physiology (Lecture/Lab:2/1) | 3 |
| BIOL 406 | Limnology (Lecture/Lab:3/1) | 4 |

Group C. Environmental Systems and Policy

| | | |
|----------|--|---|
| AGBU 350 | Agricultural and Environmental Law | 3 |
| ENVS 351 | Environmental Toxicology | 3 |
| ENVS 353 | Soil Conservation and Land Use | 3 |

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Note: While every effort is made to ensure accuracy, SMSU reserves the right to correct any clerical errors herein.

| | | |
|----------------|---|-------|
| ENVS 401 | Wetland Ecology (Lecture/Lab:3/1) | 4 |
| RURL 271 | Environmental History..... | 3 |
| Total Credits: | | 72-75 |

* Some of these courses may require prerequisites.

Bachelor of Science: Environmental Science, Humanity & Environment Option (67-70 credits)

This option is designed primarily as a major for students interested in careers in environmental law, environmental journalism, environmental education, or public service. This option is also a good choice as an add-on (second) major for students who major in such areas as business, English, education, or political science.

I. Core Requirements: (44-45 credits)

| | | |
|----------|---|---|
| BIOL 200 | Cell Biology (Lecture/Lab:3/1) | 4 |
| BIOL 302 | Botany (Lecture/Lab:3/1) | 4 |
| CHEM 121 | Basic Chemistry I* (Lecture/Lab:3/1)..... | 4 |
| CHEM 122 | Introduction Organic/Biochemistry* (Lecture/Lab:3/1)..... | 4 |
| ENG 360 | Scientific and Technical Writing | 3 |
| ENVS 101 | Physical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 102 | Historical Geology(Lecture/Lab:3/1) | 4 |
| ENVS 180 | Introduction to Environmental Science (Lecture/Lab:3/1)..... | 4 |
| ENVS 251 | Basic Soil Science (Lecture/Lab:3/1)..... | 4 |
| ENVS 390 | Research Methods in Environmental Science | 1 |
| ENVS 400 | Environmental Data Analysis and Presentation (Capstone) | 1 |
| MATH 140 | Calculus: A Short Course | 3 |
| | OR | 3 |
| MATH 200 | Statistics** | 3 |
| PHIL 107 | Environmental Ethics..... | 3 |
| ENVS 107 | Introduction to ArcGIS..... | 2 |

* May substitute CHEM 231, 232 (9 credits)

** May substitute other statistics course with program approval

II. Restricted Science Electives: * (7-8 credits)

Take TWO of the following; at least ONE must include a laboratory:

| | | |
|----------|---|---|
| BIOL 301 | Zoology (Lecture/Lab:3/1) | 4 |
| BIOL 310 | Natural History of the Vertebrates (Lecture/Lab:3/1)..... | 4 |
| BIOL 338 | Plant Diversity (Lecture/Lab:3/1)..... | 4 |
| BIOL 406 | Limnology (Lecture/Lab:3/1) | 4 |
| ENVS 210 | Rocks and Minerals I (Lecture/Lab:2/1) | 3 |
| ENVS 221 | Meteorology..... | 3 |
| ENVS 302 | Geomorphology | 3 |
| ENVS 311 | Environmental Geology | 3 |
| ENVS 351 | Environmental Toxicology..... | 3 |
| ENVS 352 | Plant Nutrients in the Environment | 3 |
| ENVS 401 | Wetland Ecology (Lecture/Lab:3/1) | 4 |

III. Restricted Humanities Electives:* (15-16 credits)

Take TWO from each group (A and B); plus ONE additional course from either group:

Group A. Diversity and Culture

| | | |
|----------|--|---|
| ANTH 301 | Cultural Geography | 3 |
| HIST 362 | Making of Modern America, 1890-1920 | 3 |
| HIST 371 | History of the American West | 3 |
| INDS 325 | Genocide, Survival, and the Indigenous Peoples..... | 3 |
| INDS 326 | Decolonization, Recovery, and the Indigenous Peoples | 3 |
| POL 355 | World Political Geography | 3 |
| PSYC 244 | Environmental Psychology | 3 |
| PSYC 317 | Social Psychology..... | 3 |
| PSYC 325 | Attitudes, Beliefs, and Behavior..... | 3 |
| SOCI 318 | Forces for Social Change..... | 3 |
| SOCI 331 | Race and Ethnicity..... | 3 |

Group B. Environmental Policy, Communication, and Education

| | | |
|----------|--|---|
| AGBU 350 | Agricultural and Environmental Law | 3 |
| ED 230 | Education in Rural America | 3 |

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| | | |
|----------|---|---|
| ENG 204 | Basic Print Journalism | 4 |
| ENG 361 | Advanced Composition | 3 |
| INDS 344 | Imperialism, Federal Policy, and Indigenous Peoples | 3 |
| POL 320 | Political Economy of the Third World | 3 |
| POL 324 | Local and Rural Politics | 3 |
| POL 356 | Politics of the Global Economy | 3 |
| RURL 271 | Environmental History | 3 |
| SPCH 230 | Interpersonal and Cross-Cultural Communication | 3 |
| SPCH 303 | Advanced Public Speaking | 3 |

Total Credits: 67-70

* Some of these courses may require prerequisites.

Bachelor of Science: Environmental Science, Geology option (72-75 credits)

The Geology option provides the student with a strong background in the physical science of Earth's hydrosphere and lithosphere (land, sediment, and rocks) as they relate to life. This option was designed to prepare students for employment as environmental consultants, specialists, engineers; the curriculum also prepares students for graduate work.

I. Core Requirements: (61-62 credits)

| | | |
|----------|---|---|
| CHEM 231 | General Chemistry I (Lecture/Lab:3/1) | 4 |
| CHEM 232 | General Chemistry II (Lecture/Lab:3/2) | 5 |
| ENG 360 | Scientific and Technical Writing | 3 |
| ENVS 101 | Physical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 102 | Historical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 120 | Regional Geography of the U.S. & Canada | 3 |
| ENVS 180 | Introduction to Environmental Science (Lecture/Lab:3/1) | 4 |
| ENVS 210 | Rocks and Minerals I (Lecture/Lab:2/1) | 3 |
| ENVS 251 | Basic Soil Science (Lecture/Lab:3/1) | 4 |
| ENVS 302 | Geomorphology | 3 |
| ENVS 310 | Hydrology (Lecture/Lab:3/1) | 4 |
| ENVS 311 | Environmental Geology | 3 |
| ENVS 390 | Research Methods in Environmental Science | 1 |
| ENVS 400 | Environmental Data Analysis and Presentation (Capstone) | 1 |
| MATH 140 | Calculus: A Short Course | 3 |
| | OR | 3 |
| MATH 200 | Statistics * | 3 |
| PHIL 107 | Environmental Ethics | 3 |
| PHYS 141 | College Physics I (Lecture/Lab:3/1) | 4 |
| PHYS 142 | College Physics II (Lecture/Lab:3/1) | 4 |
| ENVS 107 | Introduction to ArcGIS | 2 |

* May substitute other statistics course with program approval

II. Restricted Electives.* (10-12 credits)

Take at least ONE course from each group (A-C); at least ONE must include a laboratory:

Group A. Physical Science

| | | |
|----------|--|---|
| CHEM 244 | Instrumental Analysis | 4 |
| ENVS 211 | Rocks and Minerals II (Lecture/Lab:3/1) | 3 |
| ENVS 221 | Meteorology | 3 |
| ENVS 321 | Structural Geology (Lecture/Lab:3/1) | 4 |
| ENVS 331 | Invertebrate Paleontology (Lecture/Lab:3/1) | 3 |
| ENVS 341 | Stratigraphy and Sedimentation (Lecture/Lab:3/1) | 4 |
| ENVS 352 | Plant Nutrients in the Environment (Lecture/Lab:3/1) | 4 |
| ENVS 426 | Soil Morphology and Genesis | 3 |
| ENVS 450 | Environmental Instrumentation and Analysis | 3 |
| PHYS 121 | Astronomy (Lecture/Lab:3/1) | 4 |

Group B. Life Science

| | | |
|----------|--|---|
| BIOL 301 | Zoology (Lecture/Lab:3/1) | 4 |
| BIOL 302 | Botany (Lecture/Lab:3/1) | 4 |
| BIOL 310 | Natural History of the Vertebrates (Lecture/Lab:3/1) | 4 |
| BIOL 338 | Plant Diversity (Lecture/Lab:3/1) | 4 |
| BIOL 406 | Limnology (Lecture/Lab:3/1) | 4 |
| BIOL 439 | Plant Ecology (Lecture/Lab:2/1) | 3 |

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Group C. Environmental Systems and Policy

| | | |
|----------|--|---|
| AGBU 350 | Agricultural and Environmental Law | 3 |
| ENVS 351 | Environmental Toxicology | 3 |
| ENVS 353 | Soil Conservation and Land Use | 3 |
| ENVS 401 | Wetland Ecology (Lecture/Lab:3/1) | 4 |

Total Credits: 73-76

* Some of these courses may require prerequisites.

Minor: Environmental Science (30-33 credits)

The Environmental Science Minor provides an opportunity to study environmental processes, problems and solutions from several points of view. The interdisciplinary nature of the ES minor integrates environmental content with non-science courses and is suitable for students with a wide variety of majors.

I. Required Courses: (24-25 credits)

| | | |
|----------|---|---|
| ENVS 101 | Physical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 180 | Introduction to Environmental Science (Lecture/Lab:3/1) | 4 |
| ENVS 390 | Research Methods in Environmental Science | 1 |
| ENVS 400 | Environmental Data Analysis and Presentation (Capstone) | 1 |

Take ONE course from each group (A-D):

Group A.

| | | |
|----------|---|---|
| BIOL 100 | Biology in the Modern World (Lecture/Lab:3/1) | 4 |
| BIOL 200 | Cell Biology (Lecture/Lab:3/1) | 4 |

Group B.

| | | |
|----------|---|---|
| CHEM 121 | Basic Chemistry (Lecture/Lab:3/1) | 4 |
| CHEM 231 | General Chemistry I (Lecture/Lab:3/1) | 4 |

Group C.

| | | |
|----------|--|---|
| MATH 140 | Calculus: A Short Course | 3 |
| MATH 200 | Statistics | 3 |
| BADM 230 | Business Statistics | 3 |
| PSYC 200 | Statistics for the Behavioral Sciences | 3 |

Group D.

| | | |
|----------|---|---|
| ENVS 102 | Historical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 120 | Regional Geography of the U.S. and Canada | 3 |
| ENVS 210 | Rocks and Minerals I (Lecture/Lab:3/1) | 3 |
| ENVS 221 | Meteorology | 3 |
| ENVS 251 | Basic Soil Science (Lecture/Lab:3/1) | 4 |
| ENVS 310 | Hydrology (Lecture/Lab:3/1) | 4 |

II. Restricted Electives:* (6-8 credits)

Select ONE of the following options after consultation with an appropriate advisor in the ENVS Program.

Natural Science Option:

Choose TWO courses; ONE must include a laboratory:

| | | |
|----------|---|---|
| BIOL 301 | Zoology (Lecture/Lab:3/1) | 4 |
| BIOL 302 | Botany (Lecture/Lab:3/1) | 4 |
| BIOL 311 | Ecology (Lecture/Lab:3/1) | 4 |
| BIOL 338 | Plant Diversity (Lecture/Lab:3/1) | 4 |
| BIOL 339 | Plant Geography | 2 |
| BIOL 406 | Limnology (Lecture/Lab:3/1) | 4 |
| ENVS 302 | Geomorphology | 3 |
| ENVS 311 | Environmental Geology | 3 |
| ENVS 353 | Soil Conservation and Land Use | 3 |
| ENVS 401 | Wetland Ecology (Lecture/Lab:3/1) | 4 |

Social Environment Option:

Choose TWO of the following:

| | | |
|----------|--|---|
| AGBU 350 | Agricultural and Environmental Law | 3 |
| ANTH 301 | Cultural Geography | 3 |
| ECON 320 | Resource Economics | 3 |
| HIST 362 | Making of Modern America, 1890-1920 | 3 |
| HIST 371 | History of the American West | 3 |
| INDS 325 | Genocide, Survival, and the Indigenous Peoples | 3 |
| INDS 326 | Decolonization, Recovery, and the Indigenous Peoples | 3 |
| INDS 344 | Imperialism, Federal Policy, and Indigenous Peoples | 3 |

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| | | |
|----------|---|---|
| PHIL 107 | Environmental Ethics..... | 3 |
| POL 320 | Political Economy of the Third World..... | 3 |
| POL 324 | Local and Rural Politics | 3 |
| POL 356 | Politics of the Global Economy | 3 |
| RURL 271 | Environmental History..... | 3 |

Total Credits: 29-32

* Some of these courses may have prerequisites.

Minor: Geology (28 credits)

The Geology Minor provides an opportunity to study earth science processes, problems and solutions from several points of view. Students completing the Geology Minor will have a solid core of physical environmental science. This minor is suitable for both science and non-science majors.

I. Required Courses: (28 credits)*

| | | |
|----------|---|---|
| ENVS 101 | Physical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 102 | Historical Geology (Lecture/Lab:3/1) | 4 |
| ENVS 120 | Regional Geography of the United States and Canada..... | 3 |
| ENVS 210 | Rocks and Minerals I (Lecture/Lab:2/1) | 3 |
| ENVS 251 | Basic Soil Science (Lecture/Lab:3/1) | 4 |
| ENVS 302 | Geomorphology | 3 |
| ENVS 310 | Hydrology (Lecture/Lab:3/1) | 4 |
| ENVS 311 | Environmental Geology | 3 |

Total Credits: 28

* Some of these courses may have prerequisites.

ENVIRONMENTAL SCIENCE COURSES (ENVS)

ENVS 100 (LAC, E, S) Earth Science (3 credits)

This course is designed to provide non-science majors with an introduction to Earth Science. Students examine the general physical environment. The emphasis of study is earth-sun relationships, meteorology, climatology, geology, geomorphology, hydrology, natural hazards, and environmental degradation. Particular attention is devoted to the exploration of the inherent global interconnectedness of natural environmental systems and human interactions with the physical environment.

ENVS 101 (LAC, E) Physical Geology (3 credits lecture/1 credit lab)

The study of the earth and the forces that shape it, including minerals and rocks, landforms, and geological processes.

ENVS 102 Historical Geology (3 credits lecture/1 credit lab)

Study of the history and evolution of the earth including its lithosphere, hydrosphere, atmosphere, and biosphere. Topics also include the change in tectonics, rocks, environments, life, and fossils through geological time. Prerequisite: ENVS 100 or 101, or consent of instructor.

ENVS 107 Introduction to ArcGIS (2 credits)

Introduction to the basic features of Arc GIS software with hands-on exercises in a computer lab setting. Exercises will provide practice in basic GIS functions such as spatial data creation, editing, manipulation, and analysis. Basic cartographic principles will be applied to produce map displays of exercise results.

ENVS 115 Redwood River Monitoring (2 credits)

This course provides a unique opportunity for students to learn about river monitoring issues and techniques and to teach these skills to others as they mentor high school and seventh grade students. The course also allows students to take an active role in a community-based service learning project in which data generated are directly applicable to local water conservation issues.

ENVS 120 (R, S) Regional Geography of the U.S. and Canada (3 credits)

An introduction to the various regions of North America and the study of relationships between physiography, climate, ecosystems, human activities, and environmental issues in the regions.

ENVS 180 (LAC, E, T) Environmental Science (3 credits lecture/1 credit lab)

This course presents an overview of environmental science as well as basic principles of ecology and their implications for identifying and analyzing environmental problems. Also discussed is the impact of human activities on ecosystems and possible solutions to environmental problems.

ENVS 186 Special Topics (1-3 credits)

ENVS 200 Environmental Science Seminar (1 credit)

This one-credit seminar class will provide an opportunity for environmental science majors, instructors, and guest speakers to discuss and critically examine current events and environmental issues, journal articles, internship and career opportunities, career preparation, and to network with potential employers.

ENVS 210 Rocks and Minerals I (2 credits lecture/1 credit lab)

An introduction to the identification and classification of minerals and rocks. Prerequisites: ENVS 101, CHEM 131, or consent of instructor.

ENVS 211 Rocks and Minerals II (2 credits lecture/1 credit lab)

An in-depth study of mineral- and rock-forming processes. Prerequisite: ENVS 210.

ENVS 221 (LAC, E) Meteorology (3 credits)

This course provides students with an introduction to atmospheric characteristics and phenomena including: weather, composition and physical processes, air masses and global patterns of circulation, frontal systems and severe weather, climate and climate change. Particular emphasis will be placed on human interactions with the atmosphere—natural hazards, forecasting, predicting, and monitoring, pollution, and climate change—and the global nature of those interactions. For students interested in fulfilling their LAC requirements, the companion lab for this course is currently ENVS 100L—Earth Science Laboratory.

ENVS 251 (LAC, E, T) Basic Soil Science (3 credits lecture/1 credit lab)

Basic physical, chemical, and biological properties of soil. Soil genesis, classification, and principles of soil fertility.

ENVS 270 Soil Profile Description (1 credit)

This is a field course used to prepare students for intercollegiate soil judging contests. Prerequisite: ENVS 251.

ENVS 271 Collegiate Soil Judging (1 credit)

Methods of soil profile description and field interpretation of landscapes. Participation in soil judging team during regional or national contests is required. Prerequisite: ENVS 251.

ENVS 286 Special Topics (1-3 credits)**ENVS 292 Honors Credit in Earth/Space Science (1 credit)**

An independent study course designed primarily for Honors Program students. This course allows more in-depth or comprehensive study or research by certain students concurrently enrolled in at least one other Earth/Space Science course. Prerequisite: consent of instructor.

ENVS 302 Geomorphology (3 credits)

An in-depth, interdisciplinary investigation into landform development, landscape evolution, and the effects of geological processes and climate change on the Earth's surficial systems. Special emphasis on Quaternary environmental changes, glacial and interglacial transitions, and the resulting landscapes. Prerequisite: ENVS 101.

ENVS 310 Hydrology (3 credits lecture/1 credit lab)

This course deals with the processes governing the depletion and replenishment of the water resources of the land areas of the earth. Students will be introduced to basic principles of the water cycle and the methodology used in determining water flow. Prerequisites: ENVS 101, MATH 110 or higher, or consent of instructor.

ENVS 311 Environmental Geology (3 credits)

Study of the effects of geological processes on human society and the application of geological principles in identifying, evaluating, predicting, and mitigating natural hazards such as volcanoes, earthquakes, and floods. Other topics include global climatic change and human impacts on the environment from energy and resources extraction and utilization. Prerequisite: ENVS 100 or 101 or consent of instructor.

ENVS 321 Structural Geology (3 credits lecture/1 credit lab)

Classification of major and minor features of crustal deformation; laboratory solutions of three-dimensional structural problems. Prerequisites: ENVS 102; knowledge of trigonometry.

ENVS 331 Invertebrate Paleontology (2 credits lecture/1 credit lab)

The taxonomy, morphology and paleoecology of invertebrate fossils. Prerequisite: ENVS 102 or Biology major.

ENVS 341 Stratigraphy and Sedimentation (2 credits lecture/2 credits lab)

Sedimentary processes and environmental principles of stratigraphic classification and correlation. Prerequisite: ENVS 102.

ENVS 351 Environmental Toxicology (3 credits)

The study of potentially harmful agents in the environment and their effects on organisms and ecosystems. Topics covered include dose-response relationships, toxicity test methods, factors influencing toxicity, fate and effects of natural and synthetic chemicals in the environment, and ecological risk assessment. Prerequisites: ENVS 180, BIOL 200, and CHEM 121.

ENVS 352 Plant Nutrients in the Environment (3 credits)

Basic concepts related to plant nutrient availability in soils. Emphasis on the dynamic reactions of mineral elements in soil and water, and subsequent evaluation of plant growth and the environment. Diagnostic techniques for measuring specific soil fertility parameters. Prerequisite: ENVS 251.

ENVS 353 Soil Conservation and Land Use Management (3 credits)

Soil erosion and land degradation processes on rural and urban landscapes. Technical, historical, economic, social, and international considerations of soil conservation. Land-use management practices of soil conservation and methods of natural resource assessment. Prerequisite: ENVS 251.

ENVS 390 Research Methods in Environmental Science (1 credit)

This course is designed to introduce students to the basic methods of research in Environmental Science. Emphasis will be placed on how to select a research project, how to conduct a literature search, how to write a project proposal and field methods for data collection. The course is a prerequisite for ENVS 400, the capstone course in Environmental Science. Prerequisites: ENVS 101, ENVS 180 and junior status or consent of instructor.

ENVS 400 (M) Environmental Data Analysis and Presentation (1 credit)

This course is the senior capstone experience for Environmental Science majors. Students will be expected to conduct an independent research project investigating various environmental topics selected in conjunction with their research advisor. Students will gain experience in environmental data gathering, analysis, interpretation, synthesis, and presentation. Students will present their findings in a variety of oral and written formats including at the annual SMSU Undergraduate Research Conference. Prerequisite: ENVS 390.

ENVS 401 Wetland Ecology (3 credits lecture/1 credit lab)

This course is a comprehensive review of the biological, physical, and chemical aspects of wetland ecosystems. The course also covers the restoration, creation, and management of wetlands as well as policy regulating these activities. The course will include North American wetland systems as well as other wetlands around the globe. Various field data collecting exercises will emphasize local wetlands. Prerequisite: CHEM 121 or higher.

ENVS 426 Soil Morphology and Genesis (3 credits lecture/1 credit lab)

Physical and chemical weathering processes, factors of soil formation, introduction to soil mineralogy, soil survey utilization and interpretation. This course will also introduce students to various landscapes, their genesis, and land use impacts. Prerequisite: ENVS 251.

ENVS 450 Environmental Instrumentation and Data Analysis (3 credits)

In this course, students study how environmental samples are collected and analyzed for specific environmental components and characteristics biota. Planning and sample design accompanied with discussions of quality assurance and quality control are reviewed. Specific techniques for sampling water, air, soils, and biota are reviewed and conducted by students. Prerequisites: BIOL 200, CHEM 121, and MATH 200, PSYC 200, or FIN 230.

ENVS 486 Advanced Special Topics (1-3 credits)**ENVS 494 Independent Study (1-3 credits)**

Independent research, directed by a faculty member, which must be laboratory research, library research, or other experiences approved by the Environmental Science program. Prerequisite: consent of instructor.

ENVS 499 Internship in Environmental Science (1- 15 credits)

Supervised experiences in learning situations that cannot be obtained on campus. Prerequisite: consent of instructor.