ALL COURSES

BIOLOGY

BIOL 4XXX: BIOLOGY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for biology upper division elective.

BIOL 3XXX: BIOLOGY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for biology upper division elective.

BIOL 2XXX: BIOLOGY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for biology lower division elective.

BIOL 1XXX: BIOLOGY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for biology lower division elective.

BIOL 1004: Principles of Environmental Science
Cross-listed: ENVS 1004 Principles of Environmental Science and PHSC 1004 Principles of Environmental Science
This course is designed to bring the student to a basic but informed awareness of and responsible behavior toward our environment and the role of the human race therein. The content will include a study of the philosophical and scientific basis for the study of ecosystems and the environment, the nature of ecosystems, the techniques used to study the environment, the origin and development of current environmental problems, the interdisciplinary nature of environmental studies, the processes of critical thinking and problem solving, and the moral and ethical implications of environmentally-mandated decisions.
Lecture three hours, laboratory three hours. $40 laboratory fee.

BIOL 1011: Orientation to the Biological Sciences
This course orients entering students to the biological sciences. Topics examined in this course include an overview of the Tech Department of Biological Sciences and careers in biology, managing a biology curriculum (registration procedures, student responsibilities, and study skills), requirements for professional schools and graduate education, and undergraduate research opportunities.

BIOL 1014: Introduction to Biological Science
ACTS Common Course - BIOL 1004 Principles of Environmental Science
An introduction to the major concepts of biological science, with an emphasis on the development of this scientific perspective and how it applies to humans.
Note: Duplicate credit for BIOL 1014 Introduction to Biological Science and BIOL 1114 Principles of Biology will not be allowed. May not be taken for credit after completion of BIOL 1114 Principles of Biology, 2124, or 2134.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 1114: Principles of Biology
ACTS Common Course - BIOL 1014 Introduction to Biological Science
Prerequisites: scores of 21 or higher on the reading, science reasoning and mathematics portions of the enhanced ACT or completion of MATH 0903 Beginning and Intermediate Algebra with a grade of C or higher, or a grade of C or higher in a college science course.
An in depth study of biological principles and the interrelationships of biology with other sciences. Topics included are: cellular structure, intermediary metabolism and differentiation, population genetics, ecology, and evolution.
Note: Duplicate credit for BIOL 1014 Introduction to Biological Science and BIOL 1114 Principles of Biology will not be allowed.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2004: Basic Human Anatomy and Physiology
Prerequisite: A grade of C or higher in a science course or approval of the instructor.
This course is intended for students who have a need for basic studies in functional aspects of the organ systems of the human body.
Note: This course may not be taken for credit after completion of BIOL 2014 Human Anatomy, 3074, or equivalent.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2014: Human Anatomy
Prerequisite: A grade of C or higher in a science course or approval of the instructor.
This is an introductory course in human anatomy which should be useful to students in the biological and health oriented fields. The course is designed to present an introduction to the unified concepts and data that contribute to a basic understanding of the structure of the human body. The course will include familiarization with essential technical vocabulary; reference to general functions of organs and organ systems; and brief encounters with histology, embryology, and comparative anatomy.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2054: Microbiology for Health Sciences

ACTS Common Course - BIOL 2004 Basic Human Anatomy and Physiology
Prerequisites: Completion of CHEM 1113 A Survey of Chemistry and 1111 or CHEM 2124 General Chemistry I with a grade of C or higher
Microbiological concepts, including overviews of bacteria, viruses, fungi, protozoa, prions, and viroid and how they interact with humans. Designed to serve students in health-related majors other than biology.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2111: Environmental Seminar

Cross-listed: CHEM 2111 Environmental Seminar, GEOL 2111 Environmental Seminar
A seminar for students pursuing the environmental option of biology, chemistry, or geology and other students interested in environmental sciences.

BIOL 2124: Principles of Zoology

ACTS Common Course - BIOL 1054
Prerequisites: Scores of 21 or higher on the reading and science reasoning portions of the enhanced ACT or completion of MATH 0903 Beginning and Intermediate Algebra with a grade of C or higher, or a grade of C or higher in a college science course.
A survey of the major animal phyla: morphology, physiology, and natural history.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2134: Principles of Botany

ACTS Common Course - BIOL 1034
Prerequisites: Scores of 21 or higher on the reading, science reasoning and mathematics portions of the enhanced ACT or completion of MATH 0903 Beginning and Intermediate Algebra with a grade of C or higher, or a grade of C or higher in a college science course.
Introduction to the structure, function, classification, and importance of nonvascular and vascular plants.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2404: Human Anatomy and Physiology I

ACTS Common Course - BIOL 2404 Human Anatomy and Physiology I
Prerequisites: Grade of "C" or better in a college chemistry course or permission of instructor
This course is the first in a two semester sequence that covers the basic structure and function of human organ systems including mechanisms of homeostasis. Specific topics include: body organization, basic biochemistry, cell biology, metabolism, histology, the integumentary, skeletal, muscular, and nervous systems. Laboratory sessions involve dissection, microscopy, demonstration and/or experimental modeling of concepts.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2414: Human Anatomy and Physiology II

ACTS Common Course - BIOL 2414 Human Anatomy and Physiology II
Prerequisite: Grade of "C" or better in BIOL 2404 Human Anatomy and Physiology I or consent of instructor
This course is the second in a two semester sequence that covers the basic structure and function of human organ systems including mechanisms of homeostasis. Specific topics include: the Endocrine, Cardiovascular, Lymphatic, Respiratory, Digestive, Urinary, and Reproductive systems as well as principles of immunity, genetics, metabolism, fluid and electrolyte balance, and acid-base homeostasis. Laboratory sessions involve dissection, microscopy, demonstration and/or experimental modeling of concepts.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 2881: Special Topics in Biology

Offered: On demand
Prerequisite: Consent of the instructor.
This course offers specialized instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.
Note: BIOL 2884 Special Topics in Biology includes a $20 laboratory fee.

BIOL 2882: Special Topics in Biology

Offered: On demand
Prerequisite: Consent of the instructor.
This course offers specialized instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.
Note: BIOL 2884 Special Topics in Biology includes a $20 laboratory fee.

BIOL 2883: Special Topics in Biology

Offered: On demand
Prerequisite: Consent of the instructor.
This course offers specialized instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.
Note: BIOL 2884 Special Topics in Biology includes a $20 laboratory fee.

BIOL 2884: Special Topics in Biology
Offered: On demand
Prerequisite: Consent of the instructor.
This course offers specialized instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.
Note: BIOL 2884 Special Topics in Biology includes a $40 laboratory fee.

BIOL 3004: Plant Taxonomy
Prerequisites: BIOL 1114 Principles of Biology and 2134 or permission of instructor.
An overview of the major principles of classification, identification, naming, and collection of representatives of vascular plants.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 3033: Bioinformatics
Prerequisites: BIOL 1114 Principles of Biology, MATH 1113 College Algebra, and/or the permission of the instructor.
This course focuses upon the principles and major concepts in bioinformatics. Course topics may include the following: blast searching, retrieving, and analyzing DNA & protein sequences; Metagenomic data analysis; molecular phylogenetic tree creation; bacterial genome isolation, sequencing, genome assembly, and annotation; gene data analysis in R.
Note: A laptop computer with internet capabilities and operating R Studio is required.

BIOL 3034: Genetics
Prerequisites: BIOL 1114 Principles of Biology and eight hours of chemistry.
Introduction to and discussion of the principles of Mendelian, molecular and population genetics with a strong emphasis on problem solving. Laboratory exercises will involve hands-on experience with microbes, plants, animals and fungi using traditional and molecular techniques.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 3043: Conservation
Cross-listed: ENVS 3043 Conservation
Prerequisite: BIOL/ENVS/PHSC 1004 Principles of Environmental Science
A study of natural resources, their utilization in a technical society, and factors leading to their depletion.

BIOL 3054: Microbiology
Prerequisites: One semester of chemistry and one semester of biology.
An introduction to the microbial world with an emphasis on prokaryotes. Identification of bacteria based on staining, immunologic reactions, morphology and physiology. Symbionts and pathogens of human and domestic animals. Principles of control using chemical and physical agents. An overview of virology and immunology.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 3064: Parasitology
Prerequisite: BIOL 2124 Principles of Zoology
A survey of parasitism in the various phyla. Special emphasis is given to parasites that affect humans.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 3074: Human Physiology
Prerequisites: BIOL 1114 Principles of Biology, 2014, and two semesters of chemistry.
An introduction to the function of vertebrate body systems, i.e., muscle action, digestion, circulation, nervous control, endocrine, metabolism and respiration, with special emphasis on the human body.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 3084: Ichthyology
Offered: Fall
Cross-listed: FW 3084 Ichthyology
Prerequisite: BIOL 2124 Principles of Zoology
Systematics, collection, identification, natural history, and importance of fishes.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 3104: Introduction to Entomology
Cross-listed: AGPM 3104 Introduction to Entomology
This course will introduce the student to insect diversity and the identification of the major families of insects. Laboratory time will be spent learning family characteristics and collecting and preserving insect specimens. Lecture will consist of topics such as insect diversity, morphology and physiology. $25 laboratory fee.

BIOL 3111: Environmental Seminar
Cross-listed: ENVS 3111 Environmental Seminar, CHEM 3111 Environmental Seminar, and GEOL 3111 Environmental Seminar

A seminar for students pursuing the environmental option of biology, chemistry, or geology and other students interested in environmental sciences.

BIOL 3114: Principles of Ecology
Cross-listed: FW 3114 Principles of Ecology
Prerequisites: BIOL 2124 Principles of Zoology, BIOL 2134 Principles of Botany, and one semester of chemistry.
Responses of organisms to environmental variables, bioenergetics, population dynamics, community interactions, ecosystem structure and function, and major bio geographical patterns.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 3134: Invertebrate Zoology
Prerequisites: BIOL 1114 Principles of Biology, BIOL 2124 Principles of Zoology, BIOL 2134 Principles of Botany, and two semesters of chemistry.
Morphology, physiology, natural history and taxonomy of major invertebrate phyla. Laboratory maintenance and preservation techniques.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 3144: Ornithology
Offered: Spring of even years
Cross-listed: FW 3144 Ornithology
Prerequisite: BIOL 2124 Principles of Zoology
An introduction to the biology of birds. The course covers aspects of anatomy, physiology, behavior, natural history, evolution, and conservation of birds. Laboratories address field identification and natural history of the birds of Arkansas.
Note: Students will be expected to participate in an extended 5-7 day field trip.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 3154: Mammalogy
Offered: Fall
Cross-listed: FW 3154 Mammalogy
Prerequisite: BIOL 2124 Principles of Zoology
Taxonomy, identification, ecology, and study natural history of the mammals.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 3174: Physiological Ecology
Prerequisites: BIOL 1114 Principles of Biology, BIOL 2124 Principles of Zoology, BIOL 2134 Principles of Botany and two semesters of chemistry.
An in-depth study of plant and animal adaptations and responses to different environmental conditions. Comparative physiology of major systems, mechanisms of adaptation and adaptations to challenging habitats will be studied.
$40 laboratory fee.

BIOL 3184: Animal Behavior
Cross-listed: PSY 3184 Animal Behavior
Prerequisites: sophomore standing in biology or psychology, or approval of instructor.
An introductory course in animal behavior covering behavioral responses in primitive and advanced animals exposed to a wide range of environmental and social conditions. Laboratory exercises will include field as well as in-lab exercises and will focus on observational techniques and analyses of behavioral patterns in vertebrates and invertebrates.
Lecture three hours, laboratory two hours. $40 laboratory fee.

BIOL 3213: Science Education in the Elementary School
Cross-listed: PHSC 3213 Science Education in the Elementary School
Prerequisites: Junior standing, ECED 2001, ECED 2002, and at least six credit hours in science.
An overview of the most recent and research-based strategies and techniques for planning, teaching, and assessing elementary science. Inquiry-based methods and other constructivist approaches as described in the National Science Education Standards will be emphasized. Design and execution of learning activities for an elementary school setting are required.
Note: To enroll in an internet section (TC1 or AT1) of this course, one of these prerequisite courses is required: COMS 1003 Introduction to Computer Based Systems, EDMD 3013 Integrating Instructional Technology, or equivalent.
Lecture two hours, laboratory two hours; three credit hours. $40 laboratory fee.

BIOL 3223: Science Education in the Middle Level
Cross-listed: PHSC 3223 Science Education in the Middle Level
Prerequisites: 16 hours in science and MLED 2003 Introduction to Education.
This course is designed to provide pre-service teachers with an integrated approach to the teaching of science in the middle grades. Theoretical and practical aspects of teaching science will be explored and students will develop curricular materials based on their explorations.
Lecture two hours, laboratory 2 hours. $40 laboratory fee.

BIOL 3224: Herpetology
Offered: Spring of odd years

Cross-listed: FW 3224 Herpetology
Prerequisite: BIOL 2124 Principles of Zoology
The phylogeny, classification, physiology, behavior, and distribution of reptiles and amphibians. The Laboratory will stress identification of the species found in Arkansas.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 3233: Science Education in the Secondary School
Cross-listed: PHSC 3233 Science Education in the Secondary School
Offered: Fall
Prerequisites: 16 hours in biology or 16 hours in physical science and SEED 2002 Education as a Profession.
This course will examine the issues of nature and history of science, developing lessons and assessments, and science education standards for the prospective secondary school teacher. Curriculum development, including assessment and planning skills, utilizing various instructional media and inquiry methodology are emphasized. Design and execution of learning activities for a secondary school setting are required.
Lecture two hours, laboratory two hours. $40 laboratory fee.

BIOL 3243: Integrating the Three Dimensions of Science
Cross-listed: PHSC 3243 Integrating the Three Dimensions of Science
Prerequisites: Junior Standing and at least 8 hours of science.
This course integrates the three major areas of discipline in science: physical science, life science and earth science, using as a focus the processes and cross-cutting concepts of science, technology, engineering and mathematics (STEM).
$40 laboratory fee.

BIOL 3252: The Nature and Context of Science
Cross-listed: PHSC 3252 The Nature and Context of Science
Prerequisite: At least 12 hours of science courses.
This seminar course examines science from a holistic perspective. It will concentrate on examining how current science develops scientific knowledge including unifying concepts across scientific disciplines, the place of science within modern society, technology and its role in science and society, and current scientific methodology.

BIOL 3253: Teaching Methods for STEM
Cross-listed: PHSC 3253 Teaching Methods for STEM
Prerequisites: Junior Standing, ECED 2001, ECED 2002, PHSC 3243 Integrating the Three Dimensions of Science and completion of at least 8 hours of science.
An overview of strategies and techniques for planning, teaching, and assessing elementary science. An emphasis will be placed on best practices, crosscutting concepts, and core ideas outlined in current National Science Frameworks developed in conjunction with the National Research Council. Current adopted standards such as the Next Generation Science Standards (NGSS) and Common Core State Standards will be emphasized in designing learning experiences that integrate science, technology, math, and engineering (STEM) with language arts skills. Inquiry-based methods and other constructivist approaches as described in the National Science Education Frameworks will be emphasized. Design and execution of learning activities for an elementary school setting are required.
Lecture two hours, laboratory two hours; three credit hours. $40 laboratory fee.

BIOL 3353: Fundamentals of Toxicology
Cross-listed: CHEM 3353 Fundamentals of Toxicology
Offered: On demand
Prerequisite: CHEM 3254 Fundamentals of Organic Chemistry
An introduction to the science of poisons. Toxicological principles studied include structures, dose/response relationships, metabolism, mechanism of action, and gross effects of chemicals.

BIOL 3803: Applied Pathophysiology
Cross-listed: NUR 3803 Applied Pathophysiology
Prerequisites: grade of C or better in BIOL 2014 Human Anatomy or BIOL 2404 Human Anatomy and Physiology I and BIOL 2414 Human Anatomy and Physiology II or BIOL 3074 Human Physiology
This course focuses on the mechanisms and concepts of selected pathological disturbances in the human body. Emphasis is placed on how the specific pathological condition effects the functioning of the system involved, as well as its impact on all other body systems.

BIOL 4023: Immunology
Prerequisites: Four hours each in biology and chemistry and/or consent of instructor.
An overview of the human immune system, including cellular and humoral defense mechanisms, immunity to infection, hypersensitivity, transplant rejection, and tumor destruction. Immune deficiency and autoimmune diseases. Antibody structure and the use of antibodies in medicine and research.

BIOL 4024: Limnology
Offered: Spring
Cross-listed: FW 4024 Limnology

Prerequisite: BIOL (FW) 3114.
A study of physical and chemical processes in fresh water and their effects on organisms in lakes and streams. Laboratory sessions and field trips demonstrate limnological instrumentation and methodology.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 4033: Cell Biology
Prerequisites: BIOL 1114 Principles of Biology, eight hours of chemistry, and one course from BIOL 3034 Genetics, 3054, 3074, 4023 or CHEM 3344 Principles of Biochemistry.
The primary goal of this course is to build on the cell and molecular component of BIOL 1114 Principles of Biology, by performing an in-depth study of the molecular processes underlying cell structure and function through the directed application of energy and processing of information within the cell. Topics include methods of cell study, ultrastructure and function of cellular organelles, membrane structure and function, cell-cell communication, cell division and differentiation. Lecture three hours per week.

BIOL 4043: Conservation Genetics
Prerequisite: BIOL 1114 Principles of Biology, BIOL 2124 Principles of Zoology, and BIOL 2134 Principles of Botany and/or the permission of the instructor.
This course focuses upon the principles and major concepts in conservation genetics from a contemporary viewpoint. Evolutionary genetics of natural populations, the effects of population size reduction, and practical applications of conservation genetics are among the topics examined in the course.

BIOL 4044: Dendrology
Prerequisites: BIOL 1114 Principles of Biology and BIOL 2134 Principles of Botany.
A study of woody plants with emphasis on field recognition throughout the year.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 4054: Vertebrate Histology
Prerequisites: BIOL 1114 Principles of Biology, BIOL 2124 Principles of Zoology and an additional four hours in biology.
A study of functional/structural relationship of cells, tissues, and organs. Exercises in the preparation and observation of tissues and development of general principles of micro techniques.
Lecture two hours, laboratory four hours. $40 laboratory fee.

BIOL 4064: Evolutionary Biology
Prerequisites: BIOL 1114 Principles of Biology, 2124, and 2134, or permission of instructor.
This course focuses upon the principles and major concepts in evolutionary biology from a historical and contemporary viewpoint. Morphological and molecular evolution, population genetics, systematics, the fossil record, a history of life on earth, macroevolution, and adaptation are among the topics examined in this course.
Lecture 3 hours, laboratory 3 hours. $40 laboratory fee.

BIOL 4074: Molecular Genetics
Prerequisite: BIOL 3034 Genetics
This course continues the material introduced in Genetics (BIOL 3034 Genetics) with a focus upon the major concepts and techniques in contemporary molecular genetics. Current viewpoints of the gene, gene regulation, developmental genetics, recombinant DNA technology, genomics, proteonomics, and molecular evolution are among the topics examined in the course.
Lecture 3 hours, laboratory 3 hours. $40 laboratory fee.

BIOL 4083: Cancer Biology
Prerequisite: BIOL 3034 Genetics
An in-depth study of major areas and topics in cancer biology, including etiology and epidemiology of cancer, impact of the human genome mapping project, molecular genetics and cell biology of cancer, cancer modeling and clinical aspects of human cancer.

BIOL 4094: Coastal Ecology
Prerequisites: BIOL 2124 Principles of Zoology and BIOL 2134 Principles of Botany and one semester of chemistry.
A focused study of coastal ecology, as represented by the Mississippi Gulf Coast. Coastal plants, animals, their interactions, and relationship to the physical environment are explored.
Note: The course includes a required field trip to the Gulf Coast. Investigations are conducted in the marshes, bays, estuaries, bogs, and barrier island systems. Students bear the cost of food and a nominal housing fee.
$40 laboratory fee.

BIOL 4111: Environmental Seminar
Cross-listed: CHEM 4111 Environmental Seminar, GEOL 4111 Environmental Seminar
A seminar for students pursuing the environmental option of biology, chemistry, or geology and other students interested in environmental sciences.

BIOL 4112: Biology Internship
Prerequisites: Junior or senior standing and consent of internship program director.

A supervised, practical experience providing BIOL majors with a hands-on, professional experience related to their career interests. The course will allow students to gain experience in an occupational environment. Students will be placed in positions under the direction of the internship program director and work supervisor. The program will emphasize application of classroom knowledge to career goals. Approximately 200 clock hours, a proposal, a log book or journal, a summary letter from the employment supervisor, and a written report are required.
Note: A maximum of four credit hours is allowed for BIOL internship.

BIOL 4114: Biology Internship

Prerequisites: Junior or senior standing and consent of internship program director.
A supervised, practical experience providing BIOL majors with a hands-on, professional experience related to their career interests. The course will allow students to gain experience in an occupational environment. Students will be placed in positions under the direction of the internship program director and work supervisor. The program will emphasize application of classroom knowledge to career goals. Approximately 400 clock hours, a proposal, a log book or journal, a summary letter from the employment supervisor, and a written report are required.
Note: A maximum of four credit hours is allowed for BIOL internship.

BIOL 4124: Biological Assessment of Water Quality

Cross-listed: ENVS 4124 Biological Assessment of Water Quality
Offered: Spring
Prerequisites: BIOL/ENVS/PHSC 1004 Principles of Environmental Science, BIOL/FW 3114 Principles of Ecology, and three semesters of chemistry.
This course is an in-depth study of assessment of water quality by analyzing biological and chemical data.
This course may include topics and case studies from the following list:
Compare and contrast biological and chemical techniques for assessing water quality
Physical and chemical properties of water
Connecting flows and water quality
Nutrient pollution
Point and non-point sources
Effects of petroleum pollution from extraction, transportation, refining, and combustion on biological systems
SOPs, industry, and government standard practices and procedures for analyzing water quality
Species richness, species evenness, and rank abundance curves
Techniques from microbiology
Plants as assessment tools
Cladocerans and other zooplankton in laboratory or field
Macro invertebrates as indicators
Fighting Back Against Invasive Plants
Watch-dogging Wetlands Mitigation
Tackling the Dead Zone & Restoring the Mississippi
Volunteer monitoring helps identify problems and improve clean-up
Lecture 3 hours, laboratory 3 hours. This course includes several required field trips. $40 laboratory fee.

BIOL 4163: Biodiversity and Conservation Biology

Offered: Fall
Cross-listed: FW 4163 Biodiversity and Conservation Biology
Prerequisite: A course in ecology or permission of instructor
The concepts of, processes that produce, and factors that threaten biological diversity are introduced and examined. Further emphasis is placed on unique problems associated with small population size, management of endangered species and practical applications of conservation biology.

BIOL 4701: Special Methods in Biology

Prerequisite: Admission to student teaching phase of the teacher education program.
Co-requisite: SEED 4909 Teaching in the Secondary School
Intensive on campus exploration of the principles of curriculum construction, teaching methods, use of community resources, and evaluation as related to teaching biology.
$40 laboratory fee.

BIOL 4881: Advanced Topics in Biology

Offered: On demand
Prerequisites: an upper level science course and consent of the instructor.
This course offers advanced instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.
$40 laboratory fee.

BIOL 4882: Advanced Topics in Biology

Offered: On demand
Prerequisites: an upper level science course and consent of the instructor.
This course offers advanced instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.

$40 laboratory fee.

BIOL 4883: Advanced Topics in Biology
Offered: On demand
Prerequisites: an upper level science course and consent of the instructor.
This course offers advanced instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.
$40 laboratory fee.

BIOL 4884: Advanced Topics in Biology
Offered: On demand
Prerequisites: an upper level science course and consent of the instructor.
This course offers advanced instruction in an area of biological sciences that is not otherwise covered in the curriculum. The focus of the course will vary from offering to offering, thus the course may be taken more than once.
$40 laboratory fee.

BIOL 4891: Seminar in Biology
Prerequisite: An upper level biology course and senior standing.
Designed to integrate all aspects of biology by covering current topics in many fields of biology and to acquaint the student with fields of biology not covered in the general curriculum.

BIOL 4951: Undergraduate Research in Biology
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
$40 laboratory fee.

BIOL 4952: Undergraduate Research in Biology
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
$40 laboratory fee.

BIOL 4953: Undergraduate Research in Biology
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
$40 laboratory fee.

BIOL 4954: Undergraduate Research in Biology
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
$40 laboratory fee.