

Northeast Texas Community College &  
Texas A&M University – Texarkana  
2019-2020 Guided Pathways

Associate of Science in Biology to  
Bachelor of Science in Biology

NTCC		A&M-TEXARKANA	
COURSES	HOURS	COURSES	HOURS
ENGL 1301	3	BIOL 466	4
SPCH 1315 (or) SPCH 1321	3	BIOL 481	3
MATH 2413	4	UD Approved Biology Electives	30
BIOL 1406	4	Minor	18
BIOL 1407	4		
HUMA 1301*	3		
ARTS 1301*	3		
HIST 1301	3		
HIST 1302	3		
GOVT 2305	3		
GOVT 2306	3		
PSYC 2301*	3		
ENGL 1302	3		
CHEM 1411	4		
CHEM 1412	4		
CHEM 2423	4		
CHEM 2425	4		
PHED*	2		
OTHER REQUIREMENTS:			
PHYS 1401	4		
PHYS 1402	4		
TOTAL	68	TOTAL	123

\*Other Courses may Apply. See NTCC Degree Plan for Options

54 Upper Division (UD) Hours Required for the BS Degree

30 Hours of Residency Required

Travel to Main Campus in Texarkana Required to Complete Degree

LD= Lower Division

UD= Upper Division

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## MINORS

A minor requires a minimum of 18 SCH in a discipline, with the exception of the interdisciplinary studies minor that requires hours from more than one discipline.

### Biology

Code	Title	Hours
BIOL 1306	Biology for Science Majors I	3
BIOL 1106	Biology for Science Majors I Lab	1
BIOL 1307	Biology for Science Majors II	3
BIOL 466	Evolutionary Biology	3
9 SCH UD Biology Electives		9
Total Hours		19

### Biotechnology

Code	Title	Hours
BTEC 1340	Quality Assurance and Quality Control in Biotechnology	3
BTEC 2431 (or) BTEC 2441	Cell Culture Techniques Basic Molecular Biology Techniques	4
BTEC 310	Biotechnology Research Methods and Applications	4
BTEC 490	Advanced Biotechnology	4
Select 1 of the following:		4
BTEC 411	Protein Purification and Analysis	
BTEC 440	Advanced Bioinformatics	
BTEC 473	Fundamentals of DNA Forensics	
Total Hours		19

### Chemistry

Code	Title	Hours
CHEM 1311	General Chemistry I	3
CHEM 1111	General Chemistry I (Lab)	1
CHEM 1312	General Chemistry II	3
CHEM 1112	General Chemistry II (Lab)	1
CHEM 2423	Organic Chemistry I	4
CHEM 2425	Organic Chemistry II	4
CHEM 410	Biochemistry I	4
Total Hours		20

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## Communication

Code	Title	Hours
COMM 1311	Introduction to Communication Studies	3
COMM 1318	Interpersonal Communication	3
COMM 2335 (or) ENGL 2335	Argumentation and Advocacy	3
COMM 320	Communication in Organizations	3
COMM 325 (or) ENG 325	Persuasive Communication	3
MCOM 350 (or) COMM 350	Mass Communication Research Methods	3
Total Hours		18

## Criminal Justice

Code	Title	Hours
Select at least 3 SCH from each of the following areas:		9
<b>Area I</b>		
CJ 320	Deviance and Deviant Behavior	3
CJ 325	Crime and Delinquency	3
CJ 480	Criminological Theories	3
<b>Area II</b>		
CJ 315	Law and Society	3
CJ 340	Criminal Law and Procedure	3
CJ 430	Constitutional Issues: Rights of Accused and Convicted Offenders	3
CJ 485	Seminar in Criminal Justice	3
<b>Area III</b>		
CJ 310	The Juvenile Justice System	3
CJ 330	Institutional Corrections, Theory, and Practice	3
CJ 360	Probation, Parole, and Community Corrections	3
CJ 380	Ethnic and Cultural Diversity in America	3
3 courses in upper division Criminal Justice		9
Total Hours		18

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## Drama

Code	Title	Hours
DRAM 1310	Introduction to Theatre	3
DRAM 1351	Acting I	3
DRAM 310	Myths, Mysteries, and Murders	3
DRAM 311	Manners, Modernity, and Masochism	3
DRAM 335	Playwriting I	3
DRAM 450	Studies in Genre (Drama)	3
Total Hours		18

## English

Code	Title	Hours
ENGL 2360	Introduction to Literary Studies	3
DRAM 1310	Introduction to Theatre	3
MCOM 2370 (or) WGSS 1301	Introduction to American Film History Introduction to Women's, Gender, and Sexuality Studies	3
9 SCH Upper Division English		9
Total Hours		18

## Environmental Science

Code	Title	Hours
BIOL 2406	Environmental Biology	3
BIOL 307	General Ecology	3
BIOL 450	Limnology	4
BIOL 420	Global Change (EL)	3
CHEM 405	Environmental Chemistry	3
Select one of the following:		3
BIOL 421	Endangered Ecosystems	
BIOL 422	Atmosphere and Biosphere	
BIOL 330	Introduction to Geographic Information Systems	
Total Hours		19

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## Gender Studies

Code	Title	Hours
18 SCH from the following:		
CJ 350	Types of Crime	
ENG 430	Studies in Women's Literature	
HIST 416	Sex, Swords, & Sorcery: The Medieval World in Anglo-American Film	
HIST 419	American Social and Intellectual History	
HONR 345	Advanced Academic Argument Seminar/Continental Philosophy	
PSCI 305	Introduction to Political Ideologies	
PSCI 410	American Political Theory	
PSCI 426	Civil Rights and Civil Liberties	
PSCI 450	Politics and Gender	
PSY 320	Psychology of Interpersonal Interaction	
PSY 445	Human Sexual Behavior	
SOCI 2301	Marriage and Family	
Total Hours		18

## History

Code	Title	Hours
HIST 1301	United States History I	3
HIST 1302	United States History II	3
Upper-division History Electives		12
Total Hours		18

## Humanities

Code	Title	Hours
HUMA 1301	Introduction to the Humanities I	3
ARTS 1304	Art History II	3
ARTS 1316 (or) MCOM 1318	Drawing I Digital Photography I	3
MCOM 301		3
HUMA 497	Special Topics in the Humanities	3
ART 415 (or) ART 420	Impressionism and Post-Impressionism Art European Art History	3
Total Hours		18

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### Interdisciplinary Studies

Code	Title	Hours
Lower-division courses outside of major		9
Upper-division courses outside of major		9
Total Hours		18

### International Studies

Code	Title	Hours
College-level Foreign Language		6
Select 12 SCH from the following:		12
ENG 450	Studies in Genre	
ENG 472	Advanced British Literature	
HIST 451	Modern Latin America	
HIST 454	The Culture and History of Mexico	
HIST 352	Europe, 1920 to the Present	
HIST 470	Twentieth Century Asia	
PSCI 340	Introduction to Comparative Politics	
PSCI 350	Introduction to International Relations	
PSCI 442	Disputes in International Relations	
SOC 385	Globalization and Social Change	
SOC 485	Religion and Society	
Total Hours		18

### Kinesiology

Code	Title	Hours
BIOL 2401	Human Anatomy and Physiology I	4
BIOL 2402	Human Anatomy and Physiology II	4
Choose 4 courses from the following:		12
KINE 331	Motor Development	
KINE 334	Test and Measurement in Kinesiology	
KINE 343	Exercise Physiology	
KINE 1354	Concepts of Physical Activity	
KINE 432	Kinesiology and Biomechanics	
KINE 436	Motor Skills for Special Populations	
KINE 443	Exercise Testing and Prescription	
Total Hours		20

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## Leadership

Code	Title	Hours
LEAD 305	Introduction to Leadership: Concepts and Practices	3
LEAD 310	Leadership Theory and Practice	3
LEAD 400	Leadership and Gender Issues	3
LEAD 415	Organization Development and Change	3
LEAD 420	Community Leadership	3
Leadership Elective		3
Total Hours		18

## Mass Communication

Code	Title	Hours
MCOM 1307	Introduction to Mass Communication	3
Sophomore Level Mass Communication Course		3
Select one of the following:		3
MCOM 305	Media Law and Ethics	
MCOM 300	Mass Communication Theory	
MCOM 350	Mass Communication Research Methods	
Upper Division Mass Communication elective courses		6
Mass Communication Elective (upper Division or lower Division)		3
Total Hours		18

## Political Science

Code	Title	Hours
PSCI 2301	American Government I: Federal & Texas Constitutions	3
PSCI 2302	American Government II: Federal & Texas Political Behavior	3
Upper Division Political Science Elective		12
Total Hours		18

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### Pre-Health (available for Biology Majors only)

Code	Title	Hours
MATH 1342	Elementary Statistical Methods	3
BIOL 2401	Human Anatomy and Physiology I	4
BIOL 2402	Human Anatomy and Physiology II	4
BIOL 311	General Microbiology	4
Select 1 of the following courses:		3-4
BIOL 332	Molecular Pharmacology and Toxicology	
BIOL 335	Medical Terminology	
BIOL 445	Virology	
BIOL 446	Survey of Human Disease and Pathophysiology	
CHEM 410	Biochemistry I	
Total Hours		18-19

### Psychology

Code	Title	Hours
PSYC 2301	General Psychology	3
PSYC 2314	Lifespan Growth and Development	3
PSY 316	Abnormal Psychology	3
PSY 317 (or) PSY 350	Psychology of Personality Learning and Behavior	3
PSY 426	Introduction to Clinical and Counseling Psychology	3
Psychology Elective		3
Total Hours		18

### Social Studies

Code	Title	Hours
ECON 2301	Principles of Macroeconomics	3
GEOG 1303	World Regional Geography	3
GEOG 413	Cultural Geography	3
PSCI 2301	American Government I: Federal & Texas Constitutions	3
PSCI 340 (or) PSCI 350	Introduction to Comparative Politics Introduction to International Relations	3
PSCI 427 (or) PSCI 428	Public Law (EL) Intergovernmental Politics	3
Total Hours		18

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## Social Work

Code	Title	Hours
SOCI 2350	Introduction to Social Work	3
SOCW 360	Working with Diverse Populations	3
SOCW 365	Social Work Practice with Individuals and Families	3
SOCW 370	Social Welfare Policy	3
SOC 495	Sociology Internship	3
3 SCH Upper Division Elective		3
<b>Total Hours</b>		<b>18</b>

## Sociology

Code	Title	Hours
SOCI 1301	Introduction to Sociology	3
SOC 320	Deviance and Deviant Behavior	3
SOC 323	Social Stratification	3
SOC 380	Ethnic and Cultural Diversity in America	3
SOC 485	Religion and Society	3
Upper-division approved Sociology elective		3
<b>Total Hours</b>		<b>18</b>

## Spanish

Code	Title	Hours
<b>Required Lower Division Language Courses</b>		
SPAN 1311	Beginning Spanish I	3
SPAN 1312	Beginning Spanish II	3
SPAN 2311	Intermediate Spanish I	3
SPAN 2312	Intermediate Spanish II	3
<b>Required Upper Division Language Courses</b>		
SPAN 303 (or) SPAN 497	Spanish Composition and Conversation Special Topics	3
<b>Interdisciplinary Course Requirements</b>		
Select one of the following:		3
HIST 450	Latin America-The Colonial Era	
HIST 451	Modern Latin America	
HIST 454	The Culture and History of Mexico	
<b>Total Hours</b>		<b>18</b>

The minor advisor may approve the substitution of other courses which have the Latin America as their primary focus.

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Prior to enrolling in Spanish courses, students must complete the following:

- Pass a Spanish Proficiency Exam at a level of 300
- Complete an oral interview with the Spanish instructor
- Receive permission from the Spanish instructor to enroll in course

### Women's Gender and Sexuality Studies

Code	Title	Hours
WGSS 1301	Introduction to Women's Gender, and Sexuality Studies	3
WGSS 497		3
12 Credits from the following:		12
CJ 350	Types of Crime	
ENG 430	Studies in Women's Literature	
HIST 416	Sex, Swords, & Sorcery: The Medieval World in Anglo-American Film	
HIST 419	American Social and Intellectual History	
HONR 345	Advanced Academic Argument Seminar/Continental Philosophy	
PSCI 305	Introduction To Political Ideologies	
PSCI 410	American Political Theory	
PSCI 426	Civil Rights and Civil Liberties	
PSCI 450	Politics and Gender	
PSY 320	Psychology of Interpersonal Interaction	
PSY 445	Human Sexual Behavior	
SOCI 2301	Marriage and Family	
Total Hours		18

### Writing Studies

Code	Title	Hours
ENGL 2340	Writing Across the Curriculum	3
ENGL 2351	Introduction to Creative Writing	3
MCOM 2310		3
Select 3 of the following courses:		9
ENG 340	Advanced Expository Writing (EL)	
ENG 345	Advanced Composition for Educators	
ENG 350	Technical Writing (EL)	
ENG 424	History and Grammar of the English Language	
ENG 497	Special Topics	
MCOM 410	Feature Writing	
MCOM 415		
Total Hours		18

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## COURSE DESCRIPTIONS

**BIOL 1106. Biology for Science Majors I Lab. 1 Hour.** This course provides students with hands-on exploration in the biological sciences. Content includes the process of scientific inquiry, important concepts in biochemistry and genetics, and introduction to laboratory techniques.

Corequisite: [BIOL 1306](#).

**BIOL 1107. Biology for Science Majors II Lab. 1 Hour.** This course provides students with hands-on exploration in the biological sciences. Content includes a survey of plants, animals, and microorganisms as well as studies of basic biological processes such as digestion, circulation, and nervous system function. Corequisite: [BIOL 1307](#).

**BIOL 1108. Biology for Non-science Majors I Lab. 1 Hour.** This course provides students with hands-on exploration in the biological sciences. Content includes the process of scientific inquiry, important concepts in biochemistry and genetics, and introduction to laboratory techniques. Prerequisite or Corequisite: [BIOL 1308](#).

**BIOL 1109. Biology for Non-science Majors II Lab. 1 Hour.** This course provides students with hands-on exploration in the biological sciences. Content includes the process of scientific inquiry, important concepts in biochemistry and genetics, and introduction to laboratory techniques. Prerequisite or Corequisite: [BIOL 1309](#).

**BIOL 1306. Biology for Science Majors I. 3 Hours.** This course introduces the student to the nature of science and the application of science to contemporary issues. Content includes the chemistry of life, the cell, genetics, and mechanisms of evolution. Corequisite: [BIOL 1106](#).

**BIOL 1307. Biology for Science Majors II. 3 Hours.** This course introduces the student to the nature of science and the application of science to contemporary issues. Content includes plant form and function, animal form and function, and ecology. Prerequisite: [BIOL 1306](#). Corequisite: [BIOL 1107](#).

**BIOL 1308. Biology for Non-Science Majors I. 3 Hours.** This course introduces the student to the nature of science and the application of science to contemporary issues. Content includes the chemistry of life, the cell, genetics, and mechanisms of evolution. NOTE: Lab may be required for specific majors.

**BIOL 1309. Biology for Non-Science Majors II. 3 Hours.** This course introduces the student to the nature of science and the application of science to contemporary issues. Content includes plant form and function, animal form and function, and ecology. NOTE: Lab may be required for specific majors. Prerequisite: [BIOL 1308](#).

**BIOL 2401. Human Anatomy and Physiology I. 4 Hours.** This course covers basic human anatomy and physiological principles focusing on the cellular and tissue levels and their integration into the integumentary, skeletal, muscular, and nervous systems. C or better in [BIOL 1306](#) or 35 or better on the Biology Readiness test.

**BIOL 2402. Human Anatomy and Physiology II. 4 Hours.** This course covers basic human anatomy and physiological principles focusing on the nervous, endocrine, digestive, respiratory, cardiovascular, immune, urinary, and reproductive organ systems. Prerequisite: C or better in [BIOL 2401](#).

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**BIOL 2405. Introduction to Microbiology. 4 Hours.** This is an introductory microbiology course consisting of lecture and laboratory sessions and designed for the non-biology majors and allied health students. Topics include the morphology, physiology, and taxonomy of representative groups of pathogenic and nonpathogenic microorganisms; human-microbe interactions; public health microbiology; and host defense mechanisms. [BIOL 1306](#) is recommended prior to [BIOL 2405](#).

**BIOL 2406. Environmental Biology. 3 Hours.** This course provides an introduction to the basic principles of bioenvironmental science with emphasis on scientific literacy, current events, global and international issues, historic context, and the relationship between humans and the natural world. The course will also address conservation, pollution, energy, and other contemporary environmental problems.

**BIOL 289. Independent Study. 1-4 Hours.** This course provides individual instruction. Students may repeat the course when topics vary.

**BIOL 303. Animal Nutrition. 3 Hours.** This is a course designed to introduce the study of animal nutrition in all aspects, and is designed for Biology majors, especially those interested in Veterinary school. Topics include the nutrition of companion animals, livestock, and exotic species. Topics will also include the anatomy, physiology and biochemistry of the gastrointestinal system, nutrient procurement and use, feed additives, growth stimulants, metabolic diseases, and diet therapy.  
Prerequisites: [BIOL 1306](#), [BIOL 1307](#), [BIOL 1106](#), [BIOL 1107](#) or equivalent.

**BIOL 307. General Ecology. 3 Hours.** This course covers the principles of ecology with special reference to populations and their ecosystems, distribution, biotic communities, and environmental relationships. This course requires field trips. Prerequisite: [BIOL 1306](#) and [BIOL 1106](#), and [BIOL 1307](#) and [BIOL 1107](#).

**BIOL 308. Invertebrate Zoology. 3 Hours.** This course explores the diversity of invertebrate types, morphologically, embryologically, and physiologically. The course emphasizes the ecological role of invertebrates. Prerequisite: [BIOL 1306](#) and [BIOL 1106](#), and [BIOL 1307](#) and [BIOL 1107](#).

**BIOL 310. Genetics (EL). 4 Hours.** This course deals with the principles of heredity and variation and their application to plants, lower animals and man. This course integrates the principles of experiential learning and meets the criteria for undergraduate research. Prerequisite: 8 SCH of Biology.

**BIOL 311. General Microbiology. 4 Hours.** General Microbiology is an upper division undergraduate course on microbial biology consisting of both lectures and laboratory activities. In depth lectures cover eukaryotic and prokaryotic microbes and viruses, but emphasis is put on bacteria. This course provides a conceptual and experimental background in microbiology. This course is highly recommended for the pre-medical and pre-pharmacy students. Prerequisite: Successful completion of two semesters of Biology.

**BIOL 330. Introduction to Geographic Information Systems. 4 Hours.** Introduces the concepts and applications of computer-based spatial data handling, known as geographic information systems (GIS) technology. Illustrates the essential methods of GIS and its applications in fields including geography, natural resource management, planning and environmental science. Students gain application skills via a series of practical exercises illustrating problem-solving strategies using up-to-date GIS software packages. Lectures, laboratories, and special assignments will be utilized in this course. Prerequisites: [MATH 1314](#).

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**BIOL 332. Molecular Pharmacology and Toxicology. 3 Hours.** This course will provide an overview of pharmacology based on principles of drug action with emphasis on drug classes. Topics include pharmacology of the autonomic, cardiovascular, central nervous and endocrine systems. Prerequisites: [BIOL 1306](#) & 1106, [BIOL 1307](#) & 1107; and [BIOL 2401](#) & 2402 or [BIOL 449](#).

**BIOL 335. Medical Terminology. 3 Hours.** This web-based course utilizes a systems approach to the language of medicine, including the analysis and utilization of word roots, combining forms, prefixes, suffixes, and medical terms; emphasis is on written and spoken medical vocabulary. Prerequisite: Completion of two semesters of Biology courses.

**BIOL 343. Practical Paleontology. 3 Hours.** Designed for students with an interest in fossils and how they can be used to reconstruct ancient ecosystems. This course covers principles of fossil data collection, preparation, conservation, and management with hands-on experience collecting fossils from the Texas, Oklahoma and Arkansas area. Practice fossil preparation skills and learn to identify fossils based on published descriptions. Students will be introduced to paleontological research using the fossils they find in two brief guided research project. Prerequisite: [BIOL 1307](#) or equivalent or instructor's permission.

**BIOL 402. Cell and Molecular Biology. 4 Hours.** This course consists of lectures and laboratory activities and will provide a strong background in the cellular and molecular aspects of biology. Topics include: methods in cellular and molecular biology, transcription in prokaryotes and eukaryotes, posttranscriptional events, translation, DNA replication, and recombination. Prerequisite: 8 SCH of Biology.

**BIOL 415. Darwin and the Origin of Species. 3 Hours.** This course will focus on Darwin's hypotheses and compare his ideas with modern developments in the study of biological evolution.

**BIOL 420. Global Change (EL). 3 Hours.** This course will focus on global change. Major topics covered include climate change, sea level change/coastal inundation, ocean acidification, and permafrost and the changing Arctic. This course integrates the principles of Experiential Learning (EL) and meets the criteria for project-based research. Prerequisite: 6 SCH of Biology.

**BIOL 421. Endangered Ecosystems. 3 Hours.** This course will focus on endangered ecosystems and organisms from around the world. Coral reefs, Brazilian rain forest destruction, amphibian crisis, and the Gulf of Mexico Dead Zone will be studied in detail. Prerequisite: 6 SCH in Biology.

**BIOL 422. Atmosphere and Biosphere. 3 Hours.** This course will focus on how the atmosphere affects the biosphere. Stratospheric ozone, black carbon (soot), El Nino, and the environmental impact of carbon monoxide will be studied in detail. Prerequisite: 6 SCH of Biology.

**BIOL 425. Immunology. 4 Hours.** This is a course designed to introduce the immune system in all its aspects and is designed for the allied health students and biology majors. Topics include innate and adaptive immunity, generation of antibody and lymphocyte diversity, signaling molecules, cellular and humoral immunity, immunological failure in disease, and manipulation of immunity.

**BIOL 430. Astrobiology. 3 Hours.** This course will focus on the understanding that astrobiology is concerned with the origin, evolution, and distribution of life in the Universe. It investigates life in its

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cosmic context. Cross listed with [BIOL 530](#). Prerequisite: Two semesters of Biology or permission of the instructor.

**BIOL 437. Herpetology. 3 Hours.** This is a course designed to introduce the study of herpetology in all aspects, and is designed for Biology and science majors. Topics include the anatomy, physiology, taxonomy, systematics, natural history, distribution, ecology, and conservation of amphibians and reptiles; primarily North America species with special emphasis on local Texas native species. Prerequisites: [BIOL 1306](#), [BIOL 1307](#), [BIOL 1106](#), [BIOL 1107](#).

**BIOL 443. Paleozoology. 3 Hours.** This course looks at the evolution of modern animals by bringing together recent advances in genetics with the fossil record. This course will provide an evolutionary perspective on the origins of important groups of animals from single-celled organisms to modern humans through lectures, discussions, and hands-on workshops with fossils. Prerequisite: [BIOL 308](#) or instructor permission.

**BIOL 445. Virology. 3 Hours.** This course will introduce students to the biology of viruses, with a particular focus on viruses of medical importance. Topics covered will include virus structure; classification, evolution, and life cycles of viruses; methods used to study viruses; their interaction with host cells; mechanisms of pathogenicity; host responses of the host to viral infection and vaccine applications; in-depth study of the life cycles of the major classes of viruses and discussion of emerging viruses. Prerequisite: Two semesters of biology and [BIOL 311](#), or instructor permission.

**BIOL 446. Survey of Human Disease and Pathophysiology. 3 Hours.** This course is designed to provide the structural and functional characteristics of common and important diseases as well as the principles of diagnosis and treatment.

**BIOL 447. Synthetic Biology. 3 Hours.** This course will explore the application of synthetic biology in the biomolecular sciences, looking at a range of techniques that have been used to build useful tools from biological components. We will focus on the current use of molecular bioengineering in the area of human health. This course reinforces advanced concepts in molecular biology, and would be useful for students interested in careers in medicine or pharmaceutical research. Cross-listed with [BIOL 547](#). Prerequisite: Two semesters of biology and one semester of microbiology or approval of instructor.

**BIOL 449. Vertebrate Histology. 4 Hours.** This course is the study of the cell and fundamental tissue types to include the microscopic structure of the organ systems of representative vertebrates. Emphasis will be on the relationship between microscopic structure and function. Prerequisite: Two semesters of biology, with Anatomy and Physiology recommended but not required.

**BIOL 450. Limnology. 4 Hours.** This course is the study of the biological, chemical, and physical characteristics of the freshwater environment. Prerequisite: Two semesters of biology.

**BIOL 466. Evolutionary Biology. 3 Hours.** This course covers the basic principles, mechanisms, and patterns of evolutionary biology including a historical survey of related ideas. Prerequisite: Two semesters of biology.

**BIOL 470. Internship in Biology. 1-3 Hours.** This is a directed internship that provides biology students with the applications of biology related knowledge in an organization. The student receives hands-on

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experience under the joint guidance of a professional from an organization and a faculty supervisor. 1-3 credit hours available. May be repeated up to a maximum of 3 SCH. Prerequisite: Consent of instructor.

**BIOL 472. Introduction to Forensic Science. 3 Hours.** This course is a study of basic concepts, techniques, practices, and procedures of criminalistics, including the most current technologies in forensic analysis. Criminal investigation of actual cases will be discussed with a minimum of scientific terminology. In addition, the course will emphasize the nature of physical evidence, including the use of DNA profiling. This course is strongly recommended for Criminal Justice majors and Pre-Allied Health track students in Biology. Prerequisite: Junior or Senior standing.

**BIOL 473. Fundamentals of DNA Forensics. 4 Hours.** Fundamentals of DNA forensics explores the current methods of DNA typing. It encompasses current forensic DNA analysis methods, as well as biology, technology, and genetic interpretation. The course will follow the path of DNA evidence starting with sample collection and the processes of DNA extraction, quantitation, amplification, and statistical interpretation. By the end of the course, students will explore the important role of DNA evidence for law enforcement. Cross-listed with [BTEC 473](#).

**BIOL 481. Seminar in Biology. 3 Hours.** This course requires student participation in general and specific topics in biology. May be repeated in a different topic. Prerequisite: Senior standing with Biology major.

**BIOL 489. Independent Study in Biology. 1-4 Hours.** This course provides individual instruction. Students may repeat the course when topics vary.

**BIOL 490. Introduction to Biotechnology. 4 Hours.** This course will explore the principles and applications of DNA science with special reference to recombinant DNA technology. This course is highly recommended for students focusing on a career in the medical field. Prerequisite: Junior or Senior standing.

**BIOL 497. Special Topics. 1-4 Hours.** Instructors will provide an organized class designed to cover areas of specific interest. Students may repeat the course when topics vary.

**BIOL 499. Independent Research. 1-6 Hours.** Independent research in Biology conducted by a student under the guidance of a faculty member of his or her choice. The student is required to maintain a research journal and submit a project report by the end of the semester and potentially make an oral presentation on the project. SCH and hours are by arrangement and, with a change in content, this course may be repeated for credit. Prerequisite: Consent of instructor.

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