

DEPARTMENT OF BIOLOGICAL SCIENCES

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Website: Department of Biological Sciences (<http://www.shsu.edu/academics/biological-sciences/>)

Mission

The Department of Biological Sciences is dedicated to the pursuit and dissemination of knowledge and scientific discovery in the life sciences through innovative teaching and research programs. The department strives to instill in its students the philosophy of lifelong scholarship, producing scientifically literate members of society who have the knowledge to contribute and compete in a rapidly changing world.

Academic Programs

Biology, the study of living things, is an exciting and dynamic field that offers many areas of focus. Students may choose to study how life functions at the molecular, cellular, organismal, or ecological levels. The biological sciences provide opportunities to study viruses, bacteria, fungi, plants, and animals and to investigate the biochemical, physiological, morphological, anatomical, behavioral, ecological, and evolutionary processes that make each organism unique.

Highlights

The Department of Biological Sciences is located in the L (http://www.shsu.edu/map/gmap_data/info.php?loc=53)ife Sciences Building, which houses the following teaching and research capabilities:

- microscopy (scanning electron microscopy, transmission electron microscopy, and confocal microscopy)
- molecular biology
- microbiology
- morphology

The department operates the Pineywoods Environmental Research Laboratory (PERL), a 250 acre field station within 5 miles of campus that is dedicated to biological and environmental research and teaching. Additionally, the department is affiliated with the Sam Houston State University Natural History Collections.

Curriculum

Major in Biology

The Bachelor of Arts or Bachelor of Science in Biology are ideal degrees for students interested in gaining a broad background in the biological sciences, while allowing flexibility to focus on a specific biology sub-discipline. All students majoring in biology will develop competence in the fundamental principles of biology and will gain experience in botany, zoology, cellular biology, microbiology, genetics, ecology and evolution. Students take an active role in creating a degree plan that best meets their interests and their career goals. Most students pursue careers in terrestrial ecology, animal physiology, animal behavior, medical professions, biotechnology, or teacher education. Students interested in forensic science combine an extensive background in biology with substantial coursework in chemistry and criminal justice to prepare them for work with state and federal agencies.

Required Courses for the Major

The biology major may choose from two degree programs, the Bachelor of Arts or Bachelor of Science. All majors must complete the following core courses:

Code	Title	Hours
Required Courses		
BIOL 1411	General Botany	4
BIOL 1413	General Zoology	4
BIOL 2110	Being a Professional Biologist	1
BIOL 2440	Introductory Cell Biology	4
BIOL 3409	General Ecology	4
BIOL 3450	Introductory Genetics	4
BIOL 3470	General Microbiology	4
BIOL 4110	Undergraduate Seminar	1
BIOL 4361	Evolutionary Biology	3
MATH 1420	Calculus I	4
MATH 1430	Calculus II	4

or MATH 3379	Statistical Methods in Practice	
or STAT 3379	Statistical Methods in Practice	
CHEM 1411	General Chemistry I	4
CHEM 1412	General Chemistry II	4
CHEM 2123	Organic Chemistry I Lab	1
CHEM 2323	Organic Chemistry I: Lecture	3
PHYS 1301	General Phy-Mechanics & Heat	3
PHYS 1101	General Physics Laboratory I	1
PHYS 1302	Gen Phy-Snd,Lght, Elec, & Mag	3
PHYS 1102	General Physics Laboratory II	1
Total Hours		57

Students may choose their area of specialization contingent upon completion of the required core courses.

Major in Biomedical Sciences

The Biomedical Sciences degree offered by the Department of Biological Sciences provides a robust, yet flexible curriculum with an emphasis on studying the biological basis of health and disease. All students majoring in Biomedical Sciences will develop competence in the fundamental principles of biology and will gain experience in botany, zoology, cellular biology, microbiology, genetics, chemistry, mathematics and evolution. The Biomedical Sciences degree is designed to thoroughly prepare students for entrance into medical, dental, pharmacy, physician assistant, and other professional schools, as well as graduate study in the biomedical sciences and employment as a laboratory research assistant. No minor is required for the degree.

Required Courses for the Major

All Biomedical Sciences majors must complete the following core courses:

Code	Title	Hours
Course Requirements		
BIOL 1411	General Botany	4
BIOL 1413	General Zoology	4
BIOL 2440	Introductory Cell Biology	4
BIOL 3450	Introductory Genetics	4
BIOL 3470	General Microbiology	4
BIOL 4361	Evolutionary Biology	3
BIOL 4374	Biostatistics	3
or MATH 1430	Calculus II	
CHEM 1411	General Chemistry I	4
CHEM 1412	General Chemistry II	4
CHEM 2323	Organic Chemistry I: Lecture	3
CHEM 2123	Organic Chemistry I Lab	1
CHEM 2325	Organic Chemistry II: Lecture	3
CHEM 2125	Organic Chemistry II: Lab	1
CHEM 3438	Biochemistry I	4
MATH 1420	Calculus I	4
PHYS 1301	General Phy-Mechanics & Heat	3
PHYS 1101	General Physics Laboratory I	1
PHYS 1302	Gen Phy-Snd,Lght, Elec, & Mag	3
PHYS 1102	General Physics Laboratory II	1
Total Hours		58

Students may choose their area of specialization contingent upon completion of the required core courses.

- Bachelor of Arts, Major in Biology (catalog.shsu.edu/undergraduate/colleges-academic-departments/science-and-engineering-technology/biological-science/ba-biology/)
- Bachelor of Science, Major in Biology (catalog.shsu.edu/undergraduate/colleges-academic-departments/science-and-engineering-technology/biological-science/bs-biology/)

- Bachelor of Science, Major in Biomedical Sciences (catalog.shsu.edu/undergraduate/colleges-academic-departments/science-and-engineering-technology/biological-science/bs-biomedical-science/)
- Minor in Biology (catalog.shsu.edu/undergraduate/colleges-academic-departments/science-and-engineering-technology/biological-science/minor-biology/)
- Minor in Conservation Biology (catalog.shsu.edu/undergraduate/colleges-academic-departments/science-and-engineering-technology/biological-science/minor-conservation-biology/)

Student Organizations

- Beta Beta Beta (TriBeta) (<https://shsu.collegiatelink.net/organization/TriBeta/>) is an undergraduate national Biological Honor society. The organization was founded in 1922 and the Delta Tau chapter at SHSU was chartered in 1965. TriBeta is dedicated to advancing the understanding and appreciation of the biological sciences and encouraging/supporting undergraduate student scientific research. TriBeta membership requires:
 - a declared major in Biology or Biomedical Sciences; and
 - a dedicated interest in the life sciences (associate member) or completion of at least one 3000- or 4000-level biology course with a BIO GPA of 3.0 and overall SHSU GPA of 2.75 (regular member).

Membership invitations are sent to eligible students each fall and spring semester. Dr. Jim Harper (jmh091@shsu.edu) serves as faculty advisor to TriBeta.

- Sam Houston Association of Medical Oriented Students (SHAMOS) (http://www.shsu.edu/~org_shamos/) membership is available to any student interested in pursuing a career in the medical or health professions. Activities include fundraisers, community service projects, blood drives with the Gulf Coast Regional Blood Center, and canned food drives. SHAMOS sponsors an outside speaker program to inform students of the opportunities and benefits of the various disciplines of the health professions (e.g., general and specialist dentistry, general and specialist medicine, occupational therapy, physician assistant, podiatry, forensic pathology, and EMS). Dr. (bio_arg@shsu.edu) Anne Gaillard (bio_arg@shsu.edu) serves as faculty advisor to SHAMOS.

Internships and Undergraduate Research

The Department of Biological Sciences believes that "hands on" experiences, through either internships or faculty-directed undergraduate research projects, are an important complement to a student's formal coursework. Moreover, undergraduate research experience is critical for students applying to graduate programs or professional schools. We therefore strongly encourage Biology students to consider participating in an undergraduate research project. Students seeking information regarding internships and/or undergraduate research experiences should contact the Department Chair Dr. Tamara Cook (CWH005@shsu.edu). Individual faculty members may be contacted for details regarding their research programs and independent research possibilities.

Academic Distinction

Graduation with "Academic Distinction in Biological Sciences" is available at SHSU. This honor is recognized at the commencement ceremony, posted to the diploma, and to the academic transcript. Requirements for earning Academic Distinction are:

- 1) Students must maintain a GPA in their major of 3.50 or above and overall GPA of 3.25 or above to be eligible for Academic Distinction.
- 2) Students must complete six hours in the Academic Distinction program by taking in sequence Senior Thesis I (BIOL 4398) and Senior Thesis II (BIOL 4399). These credits, by University rule, cannot count towards any requirement in the degree plan, i.e. they must be in addition to normal graduation requirements.
- 2) Before a student enrolls in BIOL 4398 and declares an intention to earn Academic Distinction, the student must obtain written permission from the Department Chair, the Director of the Honors College, and the Academic Dean (Dean of Science and Engineering Technology).

If you are interested in the Academic Distinction program, please contact the Department Chair.

Scholarships

Academic scholarships are available from both the Department of Biological Sciences and the University to support student studies.

The Department of Biological Sciences scholarships include:

- Biology & Environmental Science Academic Scholarship
- Emma Normand Academic Scholarship
- Everett Wilson Biology Endowment
- Harold F. Foerster Scholarship Endowment
- James D. Long Biology Endowment
- James Patrick Weber Environmental Science Award

- Patrick Neil O'Bryant Academic Scholarship
- Roy Turner Scholarship Endowment
- S.R. Warner Academic Scholarship
- William (Bill) R. Brinkley Scholarship Endowment
- Wilson-Warner Endowed Scholarship in the Biological Sciences
- Dr. James R. DeShaw Endowed Scholarship
- Christopher M. Wilson Memorial Endowed Scholarship

Departmental scholarship information may be obtained by writing to:

Scholarships
Department of Biological Sciences
Box 2116, SHSU
Huntsville, Texas 77341-2116

or by visiting Biology Scholarships. (http://www.shsu.edu/~bio_www/scholarships.html) Information on University scholarships may be obtained at Office of Academic Scholarships (<http://www.shsu.edu/dept/financial-aid/scholarships/>) or telephone (936) 294-1672.

BIOL 1401. Environmental Science. 4 Hours.

A general course designed to cover all areas relating to contemporary environmental issues. Topics may include air, water, and soil pollution; biodiversity, climate change; agriculture; pesticides; population growth; and energy. This course is designed for non-science majors to help them meet their General Education science requirement and as a required course in the Environmental Science degree. Includes a two-hour lab. BIOL 1401 cannot be applied to either a major or a minor in Biology. Fall, Spring, Summer.

Prerequisite: Demonstrated college-level readiness in reading, writing, and math.

BIOL 1406. General Biology I. 4 Hours.

Students examine the chemical basis of life, the structure and biology of the cell, molecular biology, genetics, and mechanisms of evolution. This course is one of two introductory courses (BIOL 1406 and BIOL 1407) which comprise a two-semester survey of modern biology. The course requires a laboratory that is concurrently taken with the course.

Prerequisite: Demonstrated college-level readiness in reading, writing, and math.

BIOL 1407. General Biology II. 4 Hours.

Students undertake a detailed survey of the major phylogenetic lineages. This includes a comparison of the systems of different organisms, the ecological roles and relationships of organisms, and their behavior. This course is one of two introductory courses (BIOL 1407 and BIOL 1406) which comprise a two-semester survey of modern biology. The course requires a laboratory that is concurrently taken with the course.

Prerequisite: Demonstrated college-level readiness in reading, writing, and math.

BIOL 1408. Contemporary Biology. 4 Hours.

This course is a presentation for the non-science major of contemporary hypotheses and the unifying principles of biology, including but not limited to: the scientific method and hypothesis testing, the definition of life, cell theory, the central dogma of biology (transcription of DNA to RNA to protein), genetic regulation and heredity, metabolism and homeostasis, organismal evolution, biodiversity, and ecology. The class builds scientific literacy and critical thinking skills for use in everyday life. Credit in BIOL 1408 as a laboratory science is contingent upon completion of the laboratory section. This course is designed for non-science majors to help them meet their General Education science requirement and cannot be applied to either a major or minor in Biology. Includes a two-hour lab. Fall, Spring, Summer. >b> .

BIOL 1411. General Botany. 4 Hours.

Students are study general principles of botany. Emphasis is placed on morphology, taxonomy, genetics, physiology, and ecology of plants in an evolutionary and ecological context. Students may begin sequence with either BIOL 1411 or BIOL 1413. Includes a three-hour lab. Fall, Spring, Summer.

Prerequisite: Demonstrated college-level readiness in reading, writing, and math.

BIOL 1413. General Zoology. 4 Hours.

Students study general principles of zoology in an evolutionary context. Emphasis is placed on the anatomy, behavior, and ecology of animals. Students are introduced to evolutionary and ecological principles of biology. Students may begin sequence with either BIOL 1411 or BIOL 1413. Includes a three-hour lab. Fall, Spring, Summer.

Prerequisite: Demonstrated college-level readiness in reading, writing, and math.

BIOL 1436. Foundations Of Science. 4 Hours.

The course focuses on the nature of science as a reliable method of acquiring knowledge about the natural world. Students will learn how to apply key scientific facts, concepts, laws and theories to distinguish science from non-science, bad science, and pseudoscience by analyzing a variety of claims and case studies. By employing an innovative, interdisciplinary approach to science education, this course is designed to increase science literacy and critical thinking skills for introductory-level students. This course is designed for non-science majors to help them meet their General Education science requirement and cannot be applied to either a major or a minor in Biology. Students must enroll concurrently in the corresponding lab for this course. Includes a two-hour lab. Fall, Spring, Summer.

BIOL 2110. Being a Professional Biologist. 1 Hour.

Students explore the biological sciences as a profession and gain proficiency in the skills required of successful professional biologists. Content areas in this seminar course may include career exploration, retrieval and use of scientific literature, bibliographic procedures, critical evaluation of claims, scientific professionalism, and locating/using campus resources.

Prerequisite: Minimum grade of C in BIOL 1411 and 1413.

BIOL 2320. Sustainability and Environment. 3 Hours.

In this course, students will investigate and assess the impacts that human activity can have on the environment and will seek to identify innovative, cross-disciplinary solutions to many of the world's most pressing environmental challenges. Given that Sustainability Science involves making decisions and taking actions that are in the interest of protecting the natural world, course topics will include current sustainability issues related to population growth, agriculture, natural resources, energy usage, habitat degradation and ecological economics. This course will typically be offered every other fall semester.

Prerequisite: BIOL 1401.

BIOL 2401. Human Anatomy. 4 Hours.

This course deals with structure and form of the human body. It includes studies of cells, tissues, and organ systems. Registration is primarily for students in prenursing or majors in kinesiology or health. Two-hour laboratory. Fall, Spring, Summer as needed. Credit in this course cannot be applied to either a major or minor in Biology.

Prerequisite: Demonstrated college-level readiness in reading, writing, and math.

BIOL 2402. Human Physiology. 4 Hours.

This course will help students identify and understand the function of several important human organ systems and how these systems maintain homeostasis. Topics and the mechanisms involving circulation, digestion, metabolism, muscle action and respiration will receive the most emphasis. This course is designed to emphasize a clinical knowledge of physiology and techniques required by students studying nursing, physical therapy, and related health fields. Two-hour laboratory. Fall and Spring. Demonstrated college-level readiness in reading, writing, and math.

Prerequisite: Minimum grade of C in BIOL 2401 and CHEM 1406 or CHEM 1306 and CHEM 1106 or CHEM 1411 or CHEM 1311 and CHEM 1111.

Director/Chair: **Tamara J. Cook**

Mardelle Renee Atkins, PHD (mra043@shsu.edu), *Roland Black Endowed Assistant Professor of Biological Sciences, Department of Biological Science*, PHD, Baylor College of Medicine; BS, Texas A&M University

Jeremy R Bechelli, PHD (jrb138@shsu.edu), *Assistant Professor of Biological Sciences, Department of Biological Science*, PHD, Univ. of Texas-Med-Galveston; MS, Univ of Rochester; BA, Suny College At Brockport

Sibyl Rae Bucheli, PHD (srb009@shsu.edu), *Associate Professor of Biology, Department of Biological Science*, PHD, Ohio State Univ; MS, Ohio State Univ; BA, Hiram College

Madhusudan Choudhary, PHD (mxc017@shsu.edu), *Associate Professor of Biology, Department of Biological Science*, PHD, McMaster University; BSC, Patna University

Jerry L. Cook, PHD (bio_jlc@shsu.edu), *Professor of Biological Sciences, Department of Biological Science*, PHD, Texas A&M University; MS, Colorado State Univ-Pueblo; BS, Colorado State Univ-Pueblo

Tamara J. Cook, PHD (bio_tjc@shsu.edu), *Professor and Chair of Biological Sciences, Department of Biological Science*, PHD, Texas A&M University; MS, Univ of Nebraska-Lincoln; BS, Univ of Nebraska-Lincoln

Juan D Daza Vaca, PHD (jdd054@shsu.edu), *Assistant Professor of Biological Sciences, Department of Biological Science*, PHD, Univ of Puerto Rico-Rio Piedra; MS, Univ of Puerto Rico-Rio Piedra; BS, Universidad del Valle

Anne R Gaillard, PHD (bio_arg@shsu.edu), *Associate Professor of Biology; Associate Dean, College of Science and Engin Tec, Department of Biological Science*, PHD, Emory University; BS, Purdue University

James Michael Harper, PHD (jmharper@shsu.edu), *Associate Professor of Biology, Department of Biological Science*, PHD, Univ of Idaho; BS, Suny College At Geneseo

Joan E.N. Hudson, PHD (bio_jxn@shsu.edu), *Associate Professor of Biology, Department of Biological Science*, PHD, Iowa State University; MS, Texas A&M University; BS, Texas A&M University

Patrick J Lewis, PHD (pjl001@shsu.edu), *Professor of Biology, Associate Dean of Honors College, Department of Biological Science*, PHD, Duke University; MS, Texas Tech University; BA, Texas Tech University

William I Lutterschmidt, PHD (bio_wil@shsu.edu), *Professor of Biology, Department of Biological Science*, PHD, Univ of Oklahoma-Norman; MS, Southeastern Louisiana Univ.; BS, De Sales University

Aaron Matthew Lynne, PHD (aml027@shsu.edu), *Associate Professor of Biology, Department of Biological Science*, PHD, North Dakota State University; BS, North Dakota State University

Diane L. Neudorf, PHD (bio_dln@shsu.edu), *Professor of Biology, Department of Biological Science*, PHD, York University; MSC, University of Manitoba; BSC, University of Manitoba

Todd P Primm, PHD (tprimm@shsu.edu), *Professor of Biology, Department of Biological Science*, PHD, Baylor College of Medicine; BS, Texas A&M University

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Amber Joy Ulseth, PHD (aju005@shsu.edu), *Assistant Professor of Biological Sciences, Department of Biological Science*, PHD, Univ of Wyoming; MS, Univ of N Carolina-Greensboro; BS, Univ of Minnesota

Justin K. Williams, PHD (bio_jkw@shsu.edu), *Professor of Biology, Department of Biological Science*, PHD, Univ of Texas At Austin; BA, Univ of Texas At Austin

Jeffrey R Wozniak, PHD (jrw034@shsu.edu), *Associate Professor of Biology, Department of Biological Science*, PHD, Florida Int'L Univ; BS, Allegheny College

Interim Faculty

Anna C Blice-Baum, PHD, *Visiting Assistant Professor of Biology, Department of Biological Science*, PHD, Duquesne University; BS, Univ of South Alabama

Sarah Leslie Couch, MS (stdslk23@shsu.edu), *Lecturer of Biological Sciences, Department of Biological Science*, MS, Sam Houston State University; BS, Sam Houston State University

Danielle Marie Goodspeed, PHD (dmg048@shsu.edu), *Visiting Assistant Professor of Biological Sciences, Department of Biological Science*, PHD, Rice University; MS, Rice University; BS, Roger Williams University; BS, Roger Williams University

Volha Minich, MS (vxm050@shsu.edu), *Lecturer of Biological Sciences, Department of Biological Science*, MS, Stephen F Austin University; BS, Belarusian State University

Carly M Tribull, BA, *Visiting Assistant Professor of Biological Sciences, Department of Biological Science*, BA, Univ of Calif-Berkeley; BA, Univ of Calif-Berkeley