DEPARTMENT OF BIOLOGY

No one really knows what the world will be like 50 years from now, but it is certain that biologists will be at the forefront of science attempting to find solutions to many of the world's problems and to find answers to intriguing questions about animals, plants and microbes at the molecular, cellular, organismal and ecosystem levels. Biologists will be concerned with pollution of the environment, cause and cure of disease, population control, recurring food shortages, preservation of species and many other aspects resulting from the impact of technological changes on life forms. Those who are astounded by the array of living things on the earth and who seek challenging, creative work should consider a career in biology or in a biology-related field. The Department of Biology offers five distinct four-year curricula which lead to the baccalaureate degree. These are the Bachelor of Arts in Biology, Bachelor of Science in Biology, Bachelor of Science in Molecular and Cell Biology, Bachelor of Science in Microbiology and Bachelor of Science in Zoology. The curricula are designed to maximize postbaccalaureate opportunities in:

1. professional schools of medicine, veterinary medicine and dentistry;
2. allied health schools of physical and occupational therapy, physician assistant programs, optometry, pharmacy, and nursing;
3. graduate education leading to teaching and research careers in universities, in industry or in state or national agencies;
4. teaching at junior high or high school levels and
5. jobs in biotechnology, research laboratories, pharmaceutical companies and field biology.

The Department of Biology degree plans will enable students to complete all entrance requirements for graduate and professional schools as well as medical technology, pharmacy, optometry, nursing, physical therapy, and other paramedical and health support fields.

Advising

Because some careers in biology require advanced and/or specialized training, it is essential to take advantage of advising opportunities. In the Department of Biology, there are professional advisors in the Biology Undergraduate Programs Office. The advisor may be consulted prior to each registration period and as the student needs. Questions regarding registration, degree checks, transfer of courses, advanced placements and other academic matters are handled in the Office of Undergraduate Programs. Students with special interests in graduate study should consult the graduate advisor. Information concerning entrance to professional schools of medicine, dentistry and other health related fields is available from the Office of Professional School Advising.

Requirements for all Baccalaureate Degrees in the Department of Biology

Each student seeking a baccalaureate degree in the Department of Biology is required to master a common body of knowledge in science. In addition, the student must take courses essential to a liberal education. Students will note that the first two years of all curricula offered by the Department of Biology are similar. Electives must include a 3 hour international and cultural diversity elective and a 3 hour cultural discourse elective required for graduation. Students must also take at least two writing-intensive courses in biology. Other requirements for graduation are listed in the Texas A&M University Student Rules and this catalog.

Students in the Department of Biology must make a grade of C or better in BIOL 111 and BIOL 112. Additionally, students may have only one D in courses within the major used to satisfy required or directed electives for a given degree plan. It is required that the freshman and sophomore level biology, chemistry and math courses be completed before the start of the 5th full semester and before enrollment in any junior or senior level science.

Common Body of Knowledge

To assure that students have sufficient prerequisite training for advanced courses, Biology majors must complete a series of courses comprising a Common Body of Knowledge (CBK) prior to their junior year (5th full semester) and enrollment in upper level BIOL courses. A Biology student will be admitted into upper level Biology classes when he or she has met the following criteria:

Completion of a set of CBK courses (37-38 hours) before the student's 5th full semester to include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>Introductory Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 112</td>
<td>Introductory Biology II</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 213</td>
<td>Molecular Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 214</td>
<td>Genes, Ecology and Evolution</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 119</td>
<td>Fundamentals of Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 120</td>
<td>Fundamentals of Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 227</td>
<td>Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 237</td>
<td>Organic Chemistry Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHEM 228</td>
<td>Organic Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 238</td>
<td>Organic Chemistry Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 147</td>
<td>Calculus I for Biological Sciences</td>
<td></td>
</tr>
<tr>
<td>MATH 151</td>
<td>Engineering Mathematics I</td>
<td></td>
</tr>
<tr>
<td>MATH 171</td>
<td>Calculus I</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 148</td>
<td>Calculus II for Biological Sciences</td>
<td></td>
</tr>
<tr>
<td>MATH 152</td>
<td>Engineering Mathematics II</td>
<td></td>
</tr>
<tr>
<td>MATH 172</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>STAT 201</td>
<td>Elementary Statistical Inference</td>
<td></td>
</tr>
</tbody>
</table>

Total Semester Credit Hours 37-38

A student must be in good academic standing with an overall grade point average of a 2.0 or better overall and in the major.

Process

Students will be audited by the department to monitor progress of the CBK. Students failing to complete the CBK within the first four full semesters (two full semesters for Transfer Students) at Texas A&M University may be dropped from the roster. Students registering for upper-level Biology classes without completing the CBK, or without approval of the Undergraduate Advising Office, will be dropped from the roster.

Transfer Students

1. Transfer from within Texas A&M University. The Biology Department will accept changes of major from other departments at Texas.
Grade requirements at time of graduation:

- cumulative Texas A&M University GPA of 3.5 or higher
- cumulative honors GPA of 3.25 or higher
- no grade lower than a B in courses counting toward honors. If a student earns less than a B in an honors course, they will still receive University credit. However, they will need to take a different course to fulfill the honors requirement.

- no F*, given in cases of academic dishonesty, on the transcript

Honors recognition: All honors courses will be denoted as honors on students' official transcripts. Furthermore, students completing the honors program will have the departmental Biology honors distinction as well as any earned university or college distinction noted on the official transcript.

Admission to the Honors Program in Biology

Incoming Freshmen: Incoming freshmen applicants should indicate their interest in the departmental honors program though the ApplyTexas site and by choosing the "Apply to any Honors Program" after August 1. Qualified applicants will be contacted by the department with further information on joining Biology Honors. Current qualifications for freshman admission are detailed on the Biology Honors website (https://www.bio.tamu.edu/wordpress/index.php/biology-honors-program/).

Students who have already completed their application and now wish to apply to the Biology Honors program can use the "Apply to any Honors Program" link at the Texas A&M Honors program site (http://honorsprograms.tamu.edu/Home/) or contact biohonors@bio.tamu.edu.

Current or transfer students: Current or transfer students with a cumulative GPA of 3.5 or better can apply for admission to the Biology Honors Program by writing a short (less than 300 word) email to the department’s Honors Director. When applying students should keep in mind that they will need to fulfill all honors requirements. Please send email to: biohonors@bio.tamu.edu.

Remaining in the program

In order to remain in the Biology Honors program, students must maintain a cumulative GPA at Texas A&M of 3.5 and honors GPA of 3.25. Students falling below these standards will be placed on probation for the next semester. Students unable to meet these standards for a second semester may be dismissed from the Biology Honors Program.

Contact us

Please direct any questions to biohonors@bio.tamu.edu or the Biology Undergraduate Advising office.

Human Biology Track

This unofficial track is for students interested in pursuing professional schools including medical, dental and allied health programs (e.g., nursing, occupational therapy, optometry, pharmacy, physical therapy and physician assistant). The focus of the science courses on human biology and the emphasis is on the human body systems as related to human disease and function. The focus of the science courses on human biology and the emphasis is on the human body systems as related to human disease and function. Students interested in this track may wish to take PSYC 107 or INTRODUCTION TO PSYCHOLOGY / SOC 205 or INTRODUCTION TO SOCIOLOGY as the introductory psychology course.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 107</td>
<td>Introduction to Psychology or SOCI 205</td>
<td>3 or 4</td>
</tr>
</tbody>
</table>

Biology Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 318</td>
<td>Chordate Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 344</td>
<td>Embryology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 388</td>
<td>Principles of Animal Physiology</td>
<td>4</td>
</tr>
</tbody>
</table>
### Biological Sciences Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 437</td>
<td>Molecular and Human Medical Mycology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 454</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 456</td>
<td>Medical Microbiology</td>
<td>3</td>
</tr>
<tr>
<td><strong>Free Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HLTH 335</td>
<td>Human Diseases</td>
<td>3</td>
</tr>
<tr>
<td>HLTH 354</td>
<td>Medical Terminology for the Health Professions</td>
<td>3</td>
</tr>
<tr>
<td>URPN 370</td>
<td>Health Systems Planning</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 107</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>or SOCI 205</td>
<td>or Introduction to Sociology</td>
<td></td>
</tr>
<tr>
<td>BIOL 318</td>
<td>Chordate Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 344</td>
<td>Embryology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 388</td>
<td>Principles of Animal Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 437</td>
<td>Molecular and Human Medical Mycology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 454</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 456</td>
<td>Medical Microbiology</td>
<td>3</td>
</tr>
<tr>
<td><strong>International and Cultural Diversity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HLTH 236</td>
<td>Introduction to Health Disparities</td>
<td>3</td>
</tr>
<tr>
<td>and Diversity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HLTH 334</td>
<td>Women's Health</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Semester Credit Hours</strong></td>
<td></td>
<td>63</td>
</tr>
</tbody>
</table>

Students should consult their academic advisor about the courses that best fit their career interests.

### Education Track

This is for students wishing to acquire state certification to teach at the secondary level upon graduation. Students should seek advice from the advisors within their department and from the College of Education and Human Development, as well as from the advisor in charge of their teaching option. The intention is to make the best possible use of social science, humanity, free and directed electives in the Bachelor of Arts in Biology, thereby condensing as many of the certification requirements as possible into the degree plan and allowing the student to obtain a minor in Applied Learning in Science, Technology, Engineering and Mathematics (STEM). Courses should include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social and Behavioral Science</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INST 210</td>
<td>Understanding Special Populations</td>
<td>3</td>
</tr>
<tr>
<td>INST 222</td>
<td>Foundations of Education in a Multicultural Society</td>
<td>3</td>
</tr>
<tr>
<td><strong>Biology Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-level BIOL courses, including two writing intensive courses (<a href="http://catalog.tamu.edu/undergraduate/course-descriptions/biol/">http://catalog.tamu.edu/undergraduate/course-descriptions/biol/</a>)</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td><strong>Free Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDNG 372</td>
<td>Reading and Writing across the Middle Grades Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>or RDNG 465</td>
<td>or Reading in the Middle and Secondary Grades</td>
<td></td>
</tr>
<tr>
<td>TEBF 322</td>
<td>Teaching and Schooling in Modern Society</td>
<td>3</td>
</tr>
<tr>
<td>TEBF 324</td>
<td>Teaching Skills II</td>
<td>3</td>
</tr>
<tr>
<td><strong>TEBF 406</strong></td>
<td>Science in the Middle and Secondary School</td>
<td>3</td>
</tr>
<tr>
<td>Student teaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Semester Credit Hours</strong></td>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

Students should consult their academic advisor about the courses that best fit their career interests.

### Marine Biology Track

This unofficial track is for students desiring a more rigorous and in-depth foundation in biological courses that apply to marine environments and ecosystems. This suggested plan is ideal for students who intend to pursue graduate studies in marine biology or serve as field biologists at national seashores or sanctuaries. Suggested courses include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biology Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 335</td>
<td>Invertebrate Zoology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 440</td>
<td>Marine Biology</td>
<td>4</td>
</tr>
<tr>
<td>Related ZOOL research or field experience (<a href="http://catalog.tamu.edu/undergraduate/course-descriptions/zool/">http://catalog.tamu.edu/undergraduate/course-descriptions/zool/</a>)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Free Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCN 251</td>
<td>Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>or OCN 42</td>
<td>or Biological Oceanography</td>
<td></td>
</tr>
<tr>
<td>WFSC 311</td>
<td>Ichthyology</td>
<td>3</td>
</tr>
<tr>
<td>WFSC 425</td>
<td>Marine Fisheries</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Semester Credit Hours</strong></td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Students should consult their academic advisor about the courses that best fit their career interests.

### Ecology/Environmental Track

This unofficial track is particularly designed for students interested in environmental consulting, environmental protection and ecosystem evaluation. This suggested plan can be adapted to focus on particular areas or populations within an ecosystem. Suggested courses include:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 210</td>
<td>Technical and Business Writing</td>
<td>3</td>
</tr>
<tr>
<td><strong>Biology Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>BIOL 335</td>
<td>Invertebrate Zoology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 357</td>
<td>Ecology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 358</td>
<td>Ecology Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOL 440</td>
<td>Marine Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 462/ WFSC 462</td>
<td>Amazon River Tropical Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 467</td>
<td>Integrative Animal Behavior</td>
<td></td>
</tr>
<tr>
<td><strong>Free Electives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 315 &amp; CHEM 318</td>
<td>Fundamentals of Quantitative Analysis and Quantitative Analysis Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENTO 201</td>
<td>General Entomology</td>
<td>3</td>
</tr>
<tr>
<td>MEPS 313</td>
<td>Introduction to Plant Physiology</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3-4</td>
<td></td>
</tr>
</tbody>
</table>

Students should consult their academic advisor about the courses that best fit their career interests.
PLPA 301  Plant Pathology  
& PLPA 303 and Plant Pathology Laboratory  
WFSC 311  Ichthyology  
WFSC 401  General Mammalogy  
WFSC 402  General Ornithology  

Total Semester Credit Hours: 20-21

Students should consult their academic advisor about the courses that best fit their career interests.

Liberal Education Requirements of the University, College or State

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>American history (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history">link</a>)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Communication (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication">link</a>)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Language, philosophy and culture (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture">link</a>)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Government/Political science (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#government-political-science">link</a>)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Social and behavioral sciences (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences">link</a>)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Creative arts (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts">link</a>)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>International and cultural diversity (<a href="http://catalog.tamu.edu/undergraduate/degree-information/international-cultural-diversity-requirements/">link</a>)</td>
<td>0-3</td>
</tr>
<tr>
<td></td>
<td>Cultural Discourse (<a href="http://catalog.tamu.edu/undergraduate/degree-information/cultural-discourse-requirements/">link</a>)</td>
<td>0-3</td>
</tr>
</tbody>
</table>

Total Semester Credit Hours: 27-33

Faculty

Adams, Amanda, Lecturer  
Biology  
PHD, University of Western Ontario, 2013

Alexander, Michael B, Lab Instructor  
Biology  
PHD, Texas A&M University, 2014

Aramayo, Rodolfo A, Associate Professor  
Biology  
PHD, University of Georgia, 1992

Arzan Zarin, Aref, Assistant Professor  
Biology  
PHD, The University of Dublin, 2013

Attia, John, Lab Instructor  
Biology  
MS, Texas A&M University, 2019

Bell-Pedersen, Deborah, Professor  
Biology  
PHD, State University of New York at Albany, 1991

Benedek, Michael J, Professor  
Biology  
PHD, Stanford University, 1982

Beremond, Phillip D, Lab Instructor  
Biology  
PHD, Indiana University- Bloomington, 1979

Bernardo, Joseph, Research Associate Professor  
Biology  
PHD, Duke University, 1991

Blackmon, Heath L, Assistant Professor  
Biology  
PHD, University of Texas at Arlington, 2015

Cohn, William B, Instructional Assistant Professor  
Biology  
PHD, Texas A&M University, 2000

Criscione, Charles D, Professor  
Biology  
PHD, Oregon State University, 2005

Delmore, Kira, Assistant Professor  
Biology  
PHD, University of British Columbia, 2015

Dulin, Jennifer N, Assistant Professor  
Biology  
PHD, University of Texas Health Science Center, 2012

Epps, Sharon V, Lab Instructor  
Biology  
MS, Texas A&M University, 2013

Erickson, James W, Associate Professor  
Biology  
PHD, University of Wisconsin - Madison, 1989

Fletcher, Samantha, Lecturer  
Biology  
PHD, Texas A&M University, 2019

Garcia, Luis R, Professor  
Biology  
DDS, Texas A&M University Baylor College of Dentistry, 1999

Garcia, Luis R, Professor  
Biology  
PHD, University of Texas at Austin, 1996
 majors

- Bachelor of Arts in Biology (http://catalog.tamu.edu/undergraduate/science/biology/ba/)
- Bachelor of Science in Biology (http://catalog.tamu.edu/undergraduate/science/biology/bs/)
- Bachelor of Science in Microbiology (http://catalog.tamu.edu/undergraduate/science/biology/microbiology-bs/)
- Bachelor of Science in Molecular and Cell Biology (http://catalog.tamu.edu/undergraduate/science/biology/molecular-cell-biology-bs/)
- Bachelor of Science in Neuroscience, Molecular and Cellular Neuroscience Track (http://catalog.tamu.edu/undergraduate/science/biology/bs-neuroscience-mcb/)
- Bachelor of Science in Zoology (http://catalog.tamu.edu/undergraduate/science/biology/zoology-bs/)

minors

- Bioinformatics Minor (http://catalog.tamu.edu/undergraduate/science/biology/bioinformatics-minor/)
- Biology Minor (http://catalog.tamu.edu/undergraduate/science/biology/minor/)
- Pre-Medicine Minor (http://catalog.tamu.edu/undergraduate/science/biology/pre-medicine-minor/)