

Bachelor of Science in Biology

The Bachelor of Science in Biology degree program offers 11 Options. The Options have certain prescribed work in common, and each Option has additional requirements. Many fields in the study of biological systems require broadly based training that transcends the classical boundaries of biology. In planning a program of work to meet his or her degree requirements, a student interested in specializing in these interdisciplinary areas should choose courses both in biology and in sciences that complement biology.

Students who plan to follow Option IX, Biology Honors, must be admitted to the [Dean's Scholars Honors Program](#).

Prescribed Work Common to All Options

In the process of fulfilling degree requirements, all students must complete:

- a. Core curriculum
- b. Skills and experience flags:
 - i. Writing: two flagged courses beyond Rhetoric and Writing 306 or its equivalent, including one at the upper-division level
 - ii. Quantitative reasoning: one flagged course
 - iii. Global cultures: one flagged course
 - iv. Cultural diversity in the United States: one flagged course
 - v. Ethics: one flagged course
 - vi. Independent inquiry: one flagged course

Courses that may be used to fulfill flag requirements are identified in the [Course Schedule](#). They may be used simultaneously to fulfill other requirements, unless otherwise specified. Please note, students may not earn the cultural diversity in the United States and the global cultures flags from the same course. Students are encouraged to discuss options with their academic advisors.

- c. Courses common to all Bachelor of Science in Biology degree Options except for Option IX.
 - a. Mathematics 408C, 408R, or 408N and 408S. Students who intend to take additional calculus coursework should begin the sequence with 408C or 408N
 - b. Statistics and Data Sciences 320E
 - c. Chemistry 301 or 301C, 302 or 302C, and 204
 - d. One of the following sequences:
 1. Physics 317K, 117M, 317L, and 117N
 2. Physics 301, 101L, 316, and 116L
 3. Physics 303K, 103M, 303L, and 103N
 4. Physics 302K, 102M, 302L, and 102N

Option VIII Teaching majors may substitute Science 365 and Physics 108 for Physics 316 and 116L, 317L and 117N, 303L and 103N, or 302L and 102N; Physics 108 is offered on the pass/fail basis.

- e. Biology, including:
 - i. Biology 311C, 311D, and 325, or 315H and 325H.
 - ii. Biology 206L, Integrative Biology 208L, or Molecular Biosciences 226L. This requirement must be completed prior to progressing to additional laboratory requirement in the degree options. Students pursuing Option III, Marine and Freshwater Science, and Option IV, Microbiology and

Infectious Diseases, must complete Molecular Biosciences 226L. Students pursuing Option VIII, Teaching, must complete either Biology 206L or Integrative Biology 208L.

iii. Integrative Biology 370

- d. All students must complete at least 36 semester hours of upper-division coursework; at least 21 semester hours of upper-division coursework in biology must be completed in residence at the University.

Additional Prescribed Work for Each Option

Option I: Ecology, Evolution, and Behavior

- e. One course or pair of courses in each of the following areas:
 - i. Ecology: Integrative Biology 373, or Marine Science 320 and 120L
 - ii. Behavior and comparative physiology: Integrative Biology 322 and 122L, 359K, or 361T
 - iii. Taxon-based course: Integrative Biology 321L, 324 and 124L, 440L, 448L, 351, 352, 353F, 453L, 354L, 455L, 463L, 369F, 369L, Marine Science 352D, 354, 354C, 354E
- f. Three additional courses or pair of courses chosen from coursework in 5a through 5c and from Integrative Biology 438L, 471G, Biology 456L, Integrative Biology 364, 373L, 374 and 174L, 375, 478L, Marine Science 352C, and 354Q
- g. One course in cellular, developmental, genetics, microbiology, or molecular biology: Molecular Biosciences 320, 320L, Biology 325L, Molecular Biosciences 325T, 326R, 328, 331L, 344, 350, 349L, 350M, 366R
- h. One laboratory course or pair of courses containing a substantial field component: Integrative Biology 321L, 440L, 353F, 453L, 354L, 455L, Biology 456L, Integrative Biology 369L, 373L, Marine Science 320 and 120L, 352C, 352D, 354, 354C, 354E. A laboratory course or pair of courses may also count toward requirements 5 through 7
- i. One additional laboratory course: Molecular Biosciences 320L, Integrative Biology 321L, 124L, Biology 325L, Molecular Biosciences 331L, Integrative Biology 438L, 440L, 448L, Molecular Biosciences 349L, Integrative Biology 353F, 453L, 354L, 455L, Biology 456L, Integrative Biology 369L, 373L, 174L, 478L, 359L, 470L, Marine Science 120L, 352C, 352D, 354, 354C, 354E, 354Q. One-hour laboratory courses may require credit for or registration in a complementary lecture course. A laboratory course may also count toward requirements 5 through 7. A course counted toward requirement 8 may not also count toward requirement 9.
- j. One course chosen from the following: Integrative Biology 323, Chemistry 320M, Computer Science 303E or 313E, Geological Sciences 401 or 303, SDS 324E or 322E
- k. Enough additional coursework to make a total of 120 semester hours

Option II: Human Biology

5. Chemistry 320M, 320N, 220C
6. Biochemistry 369 or 339F
7. Integrative Biology 346
8. Three hours from genetics, genomics, and computational biology: Biochemistry 339N, Integrative Biology 321G, Molecular Biosciences 325T, 356E, 327G, 366, 366R, Integrative Biology 471, SDS 322E
9. Six hours from cellular, developmental, and molecular biology: Biochemistry 339J, 339M, 364F, Molecular Biosciences 320, 326R, 330, 336, 355, 339M, 344, 360K, 350, 350M, 361

10. Three hours from ecology, environment, and health: Molecular Biosciences 326R, 327D, 330, 361, Integrative Biology 364, Nutrition 306 or 312
11. Four hours from physiology and anatomy: Integrative Biology 446L, 365S and 165U, 478L
12. One additional laboratory course from: Molecular Biosciences 320L, Integrative Biology 122L, 124L, Molecular Biosciences 128L, Integrative Biology 323, Biology 325L, Molecular Biosciences 328D, 230L, 331L, Integrative Biology 440L, 446L, 448L, Molecular Biosciences 349L, Integrative Biology 353F, 453L, 354L, 455L, Biology 456L, Molecular Biosciences 260L, 361L, Integrative Biology 463L, 165U, 369F, 369L, 371L, 373L, 174L, 478L, 359L, 470L, Marine Science 120L, 152L. One-hour laboratory courses may require credit for or registration in a complementary lecture course.
13. Enough additional coursework to make a total of 120 semester hours

Option III: Marine Science

- e. Chemistry 320M
- f. Molecular Biosciences 326R and Integrative Biology 373
- g. Marine Science 101, 310, 320, and 120L
- h. Eighteen hours of coursework including 12 hours in Marine Science, chosen from: Molecular Biosciences 320, Integrative Biology 321L, Molecular Biosciences 328, 344, Integrative Biology 354L, 361T, 364, Molecular Biosciences 366, Integrative Biology 375, Geological Sciences 341G, Marine Science 440, 348 (Topic 1: *Training Cruise(s): Research in Biological Oceanography*), 352, 352C, 352D, 352E, 152L, 152S, 252S, 152T, 252T, 353, 354, 354C, 354E, 354J, 354Q, 354T, 354U, 355C, 356, 357, 367K, 170, 270, 370. Six hours in Marine Science must be completed at the Marine Science Institute in Port Aransas, Texas.
- i. Enough additional coursework to make a total of 120 semester hours

Option IV: Microbiology and Infectious Diseases

- e. Biochemistry 369 or 339F, and Chemistry 320M
- f. Molecular Biosciences 320, 326R, 330, 339M, 360K, 361, 366
- g. Two upper-division biology laboratory courses chosen from: Molecular Biosciences 230L, 260L, and 361L. Biology 377 or one semester of 379H may be used for one of the laboratory courses if approved by the faculty advisor.
- h. Three hours of a capstone experience (research, Molecular Biosciences 368R or a second semester of Biology 379H; internship, Natural Sciences 322; or a course/experience approved by the Capstone Faculty Advisor) and Molecular Biosciences 175C taken in the semester of or the semester immediately after the capstone experience.
- i. Twelve additional hours in upper-division coursework.
- j. Enough additional coursework to make a total of 120 semester hours

Option V: Cell and Molecular Biology

- e. Biochemistry 369 or 339F, and Chemistry 320M
- f. Molecular Biosciences 320, 326R, 350, 343, and 344 or 350M
- g. Two upper-division biology laboratory courses chosen from: Molecular Biosciences 320L, Biology 325L, Molecular Biosciences 331L, 349L. Biology 377 or one semester of Biology 379H may be used for one of the laboratory courses if approved by the faculty advisor.
- h. Three hours of a capstone experience (research, Molecular Biosciences 368R or a second semester of Biology 379H; internship, Natural Sciences 322; or a course/experience approved by the Capstone Faculty Advisor) and Molecular Biosciences

175C taken in the semester of or the semester immediately after the capstone experience.

- i. Twelve additional hours in upper-division biochemistry, biology, chemistry, computer science, neuroscience, and statistics and data science.
- j. Enough additional coursework to make a total of 120 semester hours

Option VII: Plant Biology

- e. Biochemistry 369 or 339F, and Chemistry 320M
- f. Molecular Biosciences 320, Integrative Biology 322 and 122L, Molecular Biosciences 328 and 350M
- g. Two upper-division biology laboratory courses chosen from: Molecular Biosciences 226L, 320L, Biology 325L, Molecular Biosciences 328D, 331L, or 349L. Biology 377 or one semester of Biology 379H may be used for one of the laboratory courses if approved by the faculty advisor.
- h. Three hours of a capstone experience (research, Molecular Biosciences 368R or a second semester of Biology 379H; internship, Natural Sciences 322; or a course/experience approved by the Capstone Faculty Advisor) and Molecular Biosciences 175C taken in the semester of or the semester immediately after the capstone experience.
- i. Fifteen additional hours in upper-division biochemistry, biology, chemistry, computer science, marine science, and statistics and data science.
- j. Enough additional coursework to make a total of 120 semester hours.

Option VIII: Teaching

This Option is designed to fulfill the course requirements for certification as a middle grades or secondary school science teacher in Texas; the student chooses either composite science certification with biology as the primary teaching field or life science certification. However, completion of the course requirements does not guarantee the student's certification. Information about additional certification requirements is available from the UTeach-Natural Sciences academic advisor.

- e. Chemistry 320M, 320N, and 220C or 320M and Biochemistry 369
- f. Biology courses:
 - i. Molecular Biosciences 320, 226L, 326R, and either Integrative Biology 324 and 124L, 322 and 122L, or Molecular Biosciences 328 and 128L
 - ii. At least three semester hours chosen from the following courses in physiology, neurobiology, and behavior: Integrative Biology 438L, 359K, 361T, 365S, Molecular Biosciences 367C
 - iii. At least three semester hours chosen from: Integrative Biology 440L, 448L, 453L, 455L, Biology 456L, Integrative Biology 463L, 364, 369L, 373, Marine Science 352D, 354, 354C
- g. One of the following research methods courses: Molecular Biosciences 328D, Biology 337 (Topic 2: *Research Methods: UTeach*), Chemistry 368 (Topic 1: *Research Methods: UTeach*), Physics 341 (Topic 7: *Research Methods: UTeach*)
- h. History 329U or Philosophy 329U
- i. One of the following:
 - a. For composite science certification: Biochemistry 369 (to be counted as upper-division biology hours) and six semester hours of coursework in geological sciences. Courses intended for nonscience majors may not be counted toward this requirement. The remaining composite certification content requirements are met by the chemistry, physics, and science courses used to fulfill requirements 3c, 3d, 3ei, and 5.

- b. For life science certification: Integrative Biology 373, and three additional semester hours of biology chosen from the courses listed in requirement 6b and 6c
- j. Eighteen semester hours of professional development coursework consisting of:
 - a. Curriculum and Instruction 651S (Topic 4: *Secondary School Teaching Practicum: Science*)
 - b. Curriculum and Instruction 365C or UTeach-Natural Sciences 350
 - c. Curriculum and Instruction 365D or UTeach-Natural Sciences 355
 - d. Curriculum and Instruction 365E or UTeach-Natural Sciences 360
 - e. UTeach-Natural Sciences 101, 110, and 170
- k. Students seeking middle grades certification must complete the following courses: Educational Psychology 350G, or Psychology 301 and 304; and Curriculum and Instruction 339E
- l. Enough additional coursework to make a total of 126 semester hours

Option IX: Biology Honors

- e. Breadth requirement: An honors mathematics course; Biology 315H and 325H; Chemistry 301C and 301C; and an additional three-hour honors-designated course from a department in College of Natural Sciences. Credit earned by examination may not be counted toward this requirement.
- f. An eight-semester-hour sequence of coursework in physics chosen from the following:
 - i. Physics 301, 101L, 316, and 116L;
 - ii. Physics 317K, 117M, 317L, and 117N; or
 - iii. Physics 303K, 103M, 303L, and 103N
- g. Biology 206L or Integrative Biology 208L and Chemistry 204
- h. Complete 24 hours chosen from any of the following courses:
 - i. Integrative Biology 370
 - ii. Cellular, developmental, and molecular biology: Biochemistry 369 or 339F, 339J, 339M, 364F, Molecular Biosciences 320, 326R, 330, 336, 355, 339M, 344, 360K, 350, 350M, 361
 - iii. Genetics and genomics: Biochemistry 339N, Integrative Biology 321G, 325T, 356E, 327G, Molecular Biosciences 366, 366R, Integrative Biology 471, SDS 322E
 - iv. Physiology, neuroscience, and behavior: Molecular Biosciences 328, Integrative Biology 438L, 359K, 361T, Molecular Biosciences 367C, Integrative Biology 365S, 374, Marine Science 355C
 - v. Ecology, evolution, and biodiversity: Integrative Biology 322, 323, 324, 346, 351, 364, 471G, 373, 375, Marine Science 320, 352C, 352D, 352E, 353, 354, 354C, 354E, 354Q, 356, 357
- i. Three upper-division laboratory courses in biology; Biology 377 or 379H may be used as only one of the three required upper-division laboratory courses. Courses used to fulfill this requirement may also be counted toward requirement 8.
- j. A section of Undergraduate Studies 302 or 303 that is approved by the departmental honors advisor
- k. A section of Rhetoric and Writing 309S that is restricted to students in the Dean's Scholars Honors Program
- l. Two semesters of Biology 379H
- m. Fifteen additional semester hours of coursework approved by the departmental honors advisor
- n. Six semester hours of coursework from the College of Liberal Arts and/or the College of Fine Arts
- o. Enough additional coursework to make a total of 120 semester hours

Option X: Computational Biology

- e. Statistics and Data Sciences 329C or Mathematics 340L or 341; Mathematics 362K or Statistics and Data Sciences 321; and Statistics and Data Sciences 322E
- f. Two courses from: Computer Science 303E, 313E, 323E, 323H, 324E, 326E, 327E, 329E, Mathematics 408D, 358K, 378K, Statistics and Data Sciences 322, 326E, 324E, 335, 352, 353, 358, 374C, 374E.
- g. Two courses from genetics, genomics, and computational biology: Biochemistry 339N, Integrative Biology 321G, Molecular Biosciences 325T, 356E, 327G, 366, 366R, Integrative Biology 471
- h. Six hours chosen from any of the following courses:
 - i. Cellular, development, and molecular biology: Biochemistry 369 or 339F, 339J, 339M, 364F, Molecular Biosciences 320, 326R, 330, 336, 355, 339M, 344, 360K, 350, 350M, 361
 - ii. Physiology, neuroscience, and behavior: Molecular Biosciences 328, Integrative Biology 438L, 359K, 361T, Molecular Biosciences 367C, Integrative Biology 365S, 374; Neuroscience 330; Marine Science 355C
 - iii. Ecology, evolution, and biodiversity: Integrative Biology 322, 323, 324, 346, 351, 364, 471G, 373, 375, Marine Science 320, 352C, 352D, 352E, 353, 354, 354C, 354E, 354Q, 356, 357
- i. One additional laboratory course chosen from: Molecular Biosciences 320L, Integrative Biology 122L, 124L, Molecular Biosciences 128L, Biology 325L, Molecular Biosciences 328D, 230L, 331L, Integrative Biology 440L, 446L, 448L, Molecular Biosciences 349L, 353F, Integrative Biology 453L, 354L, 455L, Biology 456L, Molecular Biosciences 260L, 361L, Integrative Biology 463L, 165U, 369F, 369L, 371L, 373L, 174L, 478L, 359L, 470L, Marine Science 120L, 152L
- j. Nine hours of additional upper-division biochemistry, biology, chemistry, marine science, mathematics, physics, and statistics and data sciences
- k. Enough additional coursework to make a total of 120 semester hours

Option XII: Genetics and Genomics

- e. Biochemistry 369 or 339F, and Chemistry 320M
- f. Molecular Biosciences 320, 325T, 344, and 350
- g. Biology 325L, and Molecular Biosciences 320L or 349L
- h. Three hours from: Biochemistry 339N, Integrative Biology 321G, Statistics and Data Sciences 322E
 - i. Six hours from: Molecular Biosciences 326R, 356E, 327G, 366, 366R
 - j. Three hours of a capstone experience (research, Molecular Biosciences 368R, Biology 377, or a second semester of Biology 379H; internship, Natural Sciences 322; or a course/experience approved by the Capstone Faculty Advisor) and Molecular Biosciences 175C taken in the semester of or the semester immediately after the capstone experience.
- k. Nine additional hours in upper-division biochemistry, biology, chemistry, computer science, mathematics, neuroscience, and statistics and data sciences
- l. Enough additional coursework to make a total of 120 semester hours

Special Requirements

Students in all Options must fulfill both the University's [General Requirements](#) for graduation and the [college requirements](#). They must also earn a grade of at least C- in each mathematics and science course required for the degree, and a grade point average in these courses of at least 2.00. More information about grades and the grade point average is given in the *General Information Catalog*.

To graduate and be recommended for certification, students who follow the teaching Option must have a University grade point average of at least 2.50. They must earn a grade of at least C- in the supporting course in requirement 8, and in each of the professional development courses listed in requirement 10 and must pass the final teaching portfolio review; those seeking middle grades certification must also earn a grade of at least C- in each of the courses listed in requirement 11. For information about the portfolio review and additional teacher certification requirements, students should consult the UTeach-Natural Sciences academic advisor.

To graduate under Option IX, students must remain in good standing in the Dean's Scholars Honors Program, must submit an honors thesis approved by the departmental honors advisor, and present their research in an approved public forum, such as the college's annual Undergraduate Research Forum. More information about the Undergraduate Research Forum is available at <https://cns.utexas.edu/>.

Order and Choice of Work

Students begin the Bachelor of Science in Biology degree program with six hours of introductory biology for science majors (Biology 311C and 311D), as well as Chemistry 301 or 301C and 302 or 302C and Mathematics 408C, 408N, or 408R. Students should consult with academic advisors about specific concentrations within biology, about appropriate courses in mathematics and physical sciences, and about course load and the balance between laboratory and nonlaboratory work. Most students select an Option by the end of the second year and take at least 21 hours of upper-division coursework in the major in the third and fourth years.