

2010 - Biology – B.S. Degree Requirements (57 to 59 total credit hours)

Introductory Biology:

Minimum of 4 credits with 1 credit being laboratory

BIO 121 - General Biology I (4)

- BIO 121 is a four-credit course, which includes one credit of laboratory, and is required of majors who do not have AP credit. Majors are no longer expected or required to take BIO 123 and 124 (General Biology II Lecture (123) and Laboratory (124)), but may do so if they so desire.
- Students with 4 to 8 credits of Advanced Placement may elect to omit the General Biology introductory courses. If you have AP credit, but take the course, you will lose the AP credit.
- Pre-health professional students who do not intend to major in biology are strongly advised to take BIO 123 and 124, subsequent to taking BIO 121; these courses fulfill professional school requirements of one year of general biology with laboratory.
- Pre-health professional students with AP credit and who major in biology are able to opt out of taking General Biology as they will have other, more advanced biology laboratory courses that will fulfill requirements of health professions schools.

Core Courses in Biology*:

BIO 305 – Integrative Biology Laboratory (3)

BIO 326 – Genetics (3)

BIO 327 – Cell Biology (3)

BIO 345 – Ecology and Evolution (3)

*note that as of 2012, students must achieve a C+ or better in at least two core courses prior to being allowed to declare the Biology major

Intro + Core

Total credits = 16

Upper Division Courses in Biology:

Total credits = 22

Students should select additional upper division courses (numbered 300 or above) totaling at least 22 credits. As detailed on the following pages, these credits should include six credits of laboratory courses and a communications skills course. Some lab courses also fulfill the communications skills requirement. Finally, the 22 credits of upper division coursework must satisfy a distribution requirement such that a minimum of 3 credit hours of coursework are taken from each list of courses on the following page.

Total Minimum Number of Biology Credits Required = 38

Non-departmental B.S. Degree Requirements = 19 – 21

Chemistry: CHE 106/107 – General Chemistry I with lab (4)
CHE 116/117 – General Chemistry II with lab (4)
CHE 275/276 – Organic Chemistry I with lab (5)

Mathematics: Either MAT 285/286 – Calculus I and II* (6) Or MAT 295/296 – Calculus I and II* (8) Or MAT 295 and APM 391 (ESF course) (7)

*Either calculus sequence fulfills the Liberal Arts Core quantitative skills requirement, but MAT 295/296 is pre-requisite for Calculus III and other higher-level mathematics courses.

Upper Division Biology Courses – Distribution Requirement for the B.S. degree

Courses in the following two lists will count toward the distribution requirement to take at least 3 of the 22 Upper Division Course Credits from each area of the biological sciences.

L- denotes a laboratory course or lecture course providing at least one credit of laboratory

The number of credit hours of lab counted toward the degree is listed after the L in parentheses.

Cell and Molecular Biology

316/317 L (3) - Anatomy and Phys. I&II*
355 - General Physiology
400 – Intro. to Toxicology
400 – Developmental Neuroscience
400 – Neuroscience and Society
407- Advanced Neuroscience
409 L (1) - General Microbiology**
422 L- (3) Bioinformatics for Life Scientists
425 L- (3) Cell and Developmental Biol. lab
432 L- (3) Environmental Microbiology lab
435 L- (3) Genetics lab
447- Immunobiology
455 L- (3) Physiology lab
462- Molecular Genetics
463 L- (3) Molecular Biotechnology*
464 L- (3) Applied Biotechnology*
465 L- (3) Molecular Biology lab
475 L- (4) Biochemistry lab
501- Biology of Cancer
503- Developmental Biology
565- Cell Physiology
575- Biochem I
576- Biochem II

Ecology and Evolutionary Biology

400 - Animal Communication
400 – Topics in Evolution
405 L – (3) Introduction to Field Biology (lab)
415- Conservation Biology
417 L- (3) Animal Behavior & Evolutionary Biol.lab
424 L- (3) Comparative Vertebrate Biology
431- Population Genetics
448- Evolutionary Medicine
451- Ecology
453 L- (2) Ecology lab
454- Evolution

*The combinations of Bio 316/317 or Bio 463/464 alone cannot be used to fulfill the 6 credit lab requirement for the BS degree. Students may take these labs, but must complete one additional 2-4 credit lab course to satisfy the laboratory requirement.

** Because Bio 409 is a 1 credit lab experience, it cannot be used to satisfy the lab requirement for the BA degree in Biology.

Additional courses that may fulfill one of the above distribution areas by petition

The following courses have variable content and/or may have different focus depending on the instructor. Students intending to use one of these courses to fulfill the Distribution Requirement for Upper Division Biology Courses should inquire in the Biology Department Office as to how a given course could count before taking the course and petitioning.

Bio 315 – Implications of Biological Research
Bio 421 – Junior/Senior Seminar

Bio 460 – Independent Research
Bio 490 – Independent Study

Upper Division Biology Courses – Laboratory Requirement for the B.S. degree –

Note – Beginning in 2012, to earn the BS students have a 6 credit upper division lab credit requirement. Students matriculating in 2010 and 2011 will also be permitted to satisfy their degree requirements with 6 rather than 7 lab credits. A simple petition form for this request will be available in the Biology Office. Please be aware of the restrictions on use of specific course combinations (Bio 316, 317 and 463, 464) to satisfy the laboratory requirement as outlined below.

a) Choose **two** of the following:

BIO 316 (Anatomy and Physiology I)*
BIO 317 (Anatomy and Physiology II)*
BIO 405 (Introduction to Field Biology)
BIO 417 (Animal Behavior and Evolution Lab)
BIO 422 (Bioinformatics for the Life Sciences)
BIO 425 (Cell and Developmental Biology Lab)
BIO 432 (Environmental Microbiology Lab)
BIO 435 (Genetics Lab)
BIO 453 (Ecology Lab)
BIO 455 (Physiology Lab)
BIO 460 (Research in Biology - 4 credits maximum allowable)
BIO 463 (Molecular Biotechnology)*
BIO 464 (Applied Biotechnology)*
BIO 465 (Molecular Biology Lab)
BIO 475 (Biochemistry Lab)
CIE 471 (Environmental Chemistry and Analysis)
CHE 477 (Preparation and Analysis of Proteins and Nucleic Acids)
BTC 401 (Molecular Biology Techniques at SUNY-CESF)

*The combinations of Bio 316/317 or Bio 463/464 alone cannot be used to fulfill the 6 credit lab requirement for the BS degree. Students may take these labs, but must complete one additional 2-4 credit lab course to satisfy the laboratory requirement.

** Because Bio 409 is a 1 credit lab experience, it cannot be used to satisfy the lab requirement for the BA degree in Biology.

b) Other lab courses available

This can include another laboratory course listed under a), or an upper division biology course with a lab component, such as BIO 431 (Population Genetics), BIO 409 (Microbiology), BIO 460

(Research in Biology) for at least one credit, a 300 level or higher ESF course with a lab (by petition), or, by petition, an appropriate upper division laboratory course from a discipline related to biology (excluding CHE 326, Organic Chem. II laboratory).

2) Elective courses:

Credit limits for certain courses:

In any combination of Bio 360 (Biology Laboratory Assistant), BIO 419 (Thesis Seminar), BIO 460 (Research in Biology), BIO 470 or 490 (Independent Study), and BIO 495 or 499 (Biology Thesis), a maximum of four credit hours can be applied toward the BS degree credit hour requirement for any purpose.

a) Communication Skills Course Requirement

These courses are to develop skills in both oral and written communication. The requirement can be completed with any one of the following:

- BIO 400 Animal Communication
- BIO 400 Developmental Neuroscience
- BIO 405 (Introduction to Field Biology)
- BIO 417 (Animal Behavior and Evolution Lab)
- BIO 419 (Thesis Seminar) plus Bio 495 or 499 (Biology Thesis)
- BIO 421 (Jr/Sr Seminar)
- BIO 425 (Cell and Developmental Bio Lab)
- BIO 428 (Capstone Seminar in Environmental Sciences)
- BIO 453 (Ecology Lab)
- BIO 455 (Physiology Lab)
- BIO 463 (Molecular Biotechnology)
- BIO 464 (Applied Biotechnology)
- BIO 465 (Molecular Biology Lab)

b) Other elective courses:

These can include any 300 level or higher Biology Department courses except courses designated not for majors. Elective courses should be taken to complete the required 22 credits of upper division courses beyond the Core courses.

Petition for elective credits outside Biology:

By approval through a petition to the Biology Department, a maximum of six credits of 300 to

600 level courses related to Biology from other departments (for example, Bioengineering, Chemistry, Earth Science, Physics, Psychology, Math, ESF) may be included as part of the elective requirement. CHE 325/326 (Organic Chem. II) may not be used for this purpose. Petitions can be obtained from the Undergraduate Secretary, room 114 LSC.

Total Minimum Biology hours required:

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