

Upper-Division Course Numbers

Biology Department upper-division course numbers provide information on course level and scheduling. Courses with higher numbers have more prerequisites. Courses with numbers less than 120 are not intended for use on biology majors. Numbers in the range 120 to 149 are third year courses requiring only lower-division prerequisites; 150 to 169 courses require some part of the upper-division core as prerequisite; and course numbers 170 or greater are more specialized fourth year courses. For schedule planning, in general: odd numbered upper-division courses are offered in the Fall; even numbered courses are offered in the Spring; course numbers ending in zero are offered both Fall and Spring; and courses offered irregularly end with a nine.

Suggested Sequence of Courses for B.S. Degree in Biology

The following comments on timing and sequence are intended for full-time students who plan to complete the B.S. degree in four years. Students with extensive extracurricular obligations should make appropriate timing adjustments to avoid overloads. See your adviser for assistance.

A total of 124 units must be completed for all Biology B.S. degree options. In addition to courses required for the major, full-time students should add General Education requirements and electives to bring semester totals to 15-17 units. Electives may include minor and credential requirements. (See *Degrees and Credentials*.)

During the first two years, both resident and transfer students should complete most General Education requirements, BioSc 1A-B, all lower-division additional requirements for the option they have selected, and any lower-division electives that might be selected within that option. BioSc 130, 140A-B, C Sci 101, and statistics should be completed as early as possible after completing 56 total units, preferably no later than the end of the third year. The remainder of the third and fourth years should be spent completing requirements for the selected option, General Education CAPSTONE courses, and electives in biology and other fields. BioSc 180 is a senior requirement and must be taken during the fourth year.

Biology Minor

A Minor in Biology may be earned by completing the 21-unit biology core: BioSc 1A-B, 130, 140A-B, 180.

Credential Program

The single subject waiver program for Life Science (Biology) consists of BioSc 1A-B, 130, 140A-B, 180; Micro 20 or 140; Chem 3A, 8, 150; Geol 1 or 2; Phys 2A-B; C Sci 101; and one course from each of the following three categories: (1) Bot 144; Ecol 151; (2) Ecol 152; Zool 120, 141, 150; (3) Bot 130; PhyAn 65, 151.

For program planning in science, consult the biology department coordinator for teacher education each semester.

COURSES

Biology (Biol)

10. Life Science (3)

Not open to students with credit in BioSc 1A, Bot 1 or Zool 1. Principles of biology related to the cell, maintenance, and relation of living organisms, heredity and elementary processes of evolution, and basic principles of ecology. General Education BREADTH, Division 2. (2 lecture, 2 lab hours)

15. An Ecological Approach to Life Science (5)

Concurrent enrollment in Geol 15, N Sci 15, S Sci 15 required. Portion of *Man/Woman and the Natural Environment* Cluster. An introduction to biological concepts and investigational methods in the natural environment. Lecture, lab, and fieldwork. General Education BREADTH, Division 2. (Field trip fee required) (See *Man/Woman and the Natural Environment*, School of Natural Sciences.)

100. Nature Study (3)

Not allowable for credit for biological or physical science majors or minors. Prerequisite: a college level biology course. Evaluation of natural science programs at the elementary level; optional opportunities in developing K-9 environmental study material or designing environmental awareness topics for adult groups; emphasis on life science programs dealing with the interaction of man and the biosphere. (2 lecture, 3 lab hours) (Former Biol 101)

110. Human Ecology (3)

The study of the relationships between humans and their environment, both natural and man-made; emphasis on scientific understanding of root causes of current environmental problems. General Education CAPSTONE Cluster course. (Former Biol 105)

112W. The Scientific Paper (3)

Not allowable for credit for biological or physical science majors or minors. Pre-

requisite: Engl 1. An introduction to the preparation, structure, use, and writing of the scientific research article; the meaning, logic, and structure of the abstract, introduction (historical review), methods, results, discussion, conclusion, and bibliographic citation. Meets the upper-division writing skills requirement for graduation. (Former Biol 102W)

121. Electron Microscopy (4)

Prerequisite: permission of instructor. Preparation and examination of biological specimens. Basics of electron microscopy and interpretation of electron micrographs. (1 lecture, 9 lab hours) (Former Biol 150)

172. Biological

Methods and Techniques (3)

Open to credential candidates in the life science or physical science waiver program; course meets the professional education requirement of 30 units for the clear credential. Collection and preparation of biological materials and specimens for instruction. Designing and conducting laboratory investigations. Planning and directing field trips. (1 lecture, 6 lab hours) (Former Biol 162)

189T. Topics in Biology (1-4; max total 6)

Prerequisite: permission of instructor. Investigation of selected areas in the field of biology. (Lecture and/or laboratory) (Former Biol 185T; Micro 160T)

190. Independent Study

(1-3; max see reference)

See *Academic Placement — Independent Study*. Approved for SP grading. (Former Bot 190, Ent 190, Micro 190, Phy 190, Zool 190)

Biological Science Core (BioSc)

1A-B. Introductory Biology (4-4)

Two-semester sequence required of all biology majors. Thematic introduction to the unifying concepts of life science: chemical basis of life; cellular processes; energy metabolism; genetics; evolution; diversity of life; ecology and environmental biology. BioSc 1A is prerequisite to BioSc 1B. BioSc 1A meets the criteria for General Education BREADTH, Division 2. (3 lecture, 3 lab hours)

130. General Ecology (3)

Prerequisite: BioSc 1A-B; Math 70 or equivalent recommended. Required of all biology majors. The structure, function, organization, and regulation of populations, communities, and ecosystems. The role of