

Biological Sciences

Major Requirements

Some of the following requirements for the major may also fulfill the college's breadth requirements. Consult with a department advisor for program planning.

The major requirements for the B.S. in Biological Sciences are as follows:

1. Life Sciences core requirements (68-72 units)
Students must complete all required courses with a grade of "C-" or better and with a cumulative GPA in the core courses of at least 2.0. Grades of "D" or "F" in two core courses, either separate courses or repetitions of the same course, are grounds for discontinuation from the major.

- a) BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C
- b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC, CHEM 112A, CHEM 112B, CHEM 112C
- c) MATH 008B or MATH 009A, MATH 009B
- d) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC
- e) STAT 100A
- f) BCH 100 or BCH 110A

2. As specified in the individual tracks, at least 36 upper-division units for the major and 16 units of substantive course work related to the major. Courses in Statistics and Biochemistry taken as part of the core may be included.

A student is subject to discontinuation from the major whenever the GPA in upper-division course work is below 2.0. Students finding themselves in this circumstance must meet with an advisor.

Bioinformatics and Genomics Track

Bioinformatics and Genomics are popular new fields whose emergence is catalyzed by the explosion of data made available through automated DNA sequencing. They meld in a seamless fashion genetics, molecular and cellular biology, statistics, and computer science. This curricular track has been carefully designed to be flexible

so that avenues of study can be computational or experimental, or both, and therefore has wide appeal to students of varying interests. This track is unique in its ability to accommodate agricultural, microbial, and animal bioinformatics and genomics under a single programmatic umbrella and allow students to interface with instructors from a broad array of departments. The interdisciplinary nature of Bioinformatics and Genomics prepares students to be highly competitive for further graduate education or for immediate placement in biotechnology and allied industries.

1. Computer Science and Mathematics (16 units). These courses satisfy the related areas requirement.
a) CS 010, CS 012, CS 014
b) MATH 009C

2. Ethics and Science (4 units):
At least one course from PHIL 117, PHIL 118, PHIL 161, RLST 170. This course may also satisfy a portion of the college's breadth requirements in Humanities.

3. Upper-division requirements (a minimum of 45 units)

- a) BCH 110A (recommended) or BCH 100
- b) BIOL 102, BIOL 105, BIOL 107A or BCH 110C, BIOL 119
- c) STAT 100A, STAT 100B, STAT 160A, STAT 160B
- d) Breadth electives (at least one course from each area)
 - (1) Bioinformatics and Computational Biology (CS 141 and MATH 112 recommended): CS 141, CS 166, CS 170, CS 171, MATH 112, MATH 120, MATH 135A, STAT 160C, STAT 161, STAT 170A, STAT 170B
 - (2) Genomics, Macromolecules, and Molecular Biology: BIOL 107B, BIOL 108, BIOL 109 or BCH 153/BIOL 153/BPSC 153 or BCH 162, BPSC 148/BIOL 148, CBNS 150/ENTX 150

Note Independent study or research in the field of bioinformatics or genomics is recommended.

Biology Track

The Biology track provides up-to-date preparation for postgraduate study and careers in the fields of medicine, health science, teaching, and research. These options require understanding

and integration of the different levels and processes of biological organization. The levels include cell and molecular, organismal, community and population; important life processes are reproduction, development, and evolution. An overview is presented in the introductory courses (BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C), and emphasis is placed on the unifying principles of the discipline.

The upper-division courses are more specialized and provide in-depth examination of specific subfields of biology. From a list of courses in each area, students select three upper-division courses in cell or molecular biology, two courses in the structure and function of organisms, and two courses in a subfield with the following integrated and overlapping topics: ecology, evolution, systematics, and behavior. Hands-on learning is encouraged so that students can participate rather than just observe science in this age of technology. Among the upper-division biology courses, there must be at least two courses that have a laboratory or field component. Students in this track also select two courses from a number of options in computer science and statistics. Statistics is needed to plan and carry out experiments, read and understand scientific literature, and interpret data in medicine and other fields of science. Computers facilitate communication and data processing and storage, and computer technology is now an integral part of modern life.

1. Upper-division requirements [at least 36 units from the following, including two courses with laboratory or field component (indicated by *)]

Note Courses listed in more than one category may be used to satisfy only one requirement.

- a) Cell/Molecular (minimum of one course from each category)
 - (1) BCH 100 or both BCH 110A and BCH 110B
 - (2) BIOL 102 or BIOL 115
 - (3) BIOL 107A or BCH 110C, CBNS 101 or BIOL 113 or BIOL 114, BIOL 119, BIOL 128/CBNS 128, BPSC 155/BIOL 155
- b) Functional Biology of Organisms

(minimum of two courses with lecture component)

BIOL 100/ENTM 100*,
BIOL 104/BPSC 104*,
BIOL 121/MCBL 121,
BIOL 121L/MCBL 121L*, BIOL
124/MCBL 124, BIOL 132/BPSC
132*,
BIOL 134/PLPA 134,
BIOL 134L/PLPA 134L*,
BIOL 138/BPSC 138*,
BIOL 143/BPSC 143*, BIOL
151*, BIOL 157*, BIOL 159/NEM
159, BIOL 161A*, BIOL 161B*,
BIOL 173/ENTM 173*, BIOL 174,
BIOL 175, BIOL 178, CBNS 106,
CBNS 169

c) Ecology/Evolution/Systematics/
Behavior (minimum of two
courses with lecture component)
BIOL 105, BIOL 108, BIOL 112/
BPSC 112/ENTM 112, BIOL 116,
BIOL 116L*, BIOL 117 or BIOL
127/ENTM 127, BIOL 119, BIOL
152/GEO 152*, BIOL 160, BIOL
160L*, BIOL 162/ENTM 162,
BIOL 163*, BIOL 174

d) Additional Elective Courses
BIOL 107B, BIOL 109* or BCH
153/
BIOL 153/BPSC 153*, BIOL 110,
BIOL 120/MCBL 120/
PLPA 120, BIOL 120L/MCBL
120L/PLPA 120L*, BIOL 122/
MCBL 122, BIOL 123/MCBL
123/PLPA 123, BIOL 148/BPSC
148, BIOL 158, BIOL 165/BPSC
165*, BIOL 166*, BIOL 168,
BIOL 171, BIOL 171L*, BIOL 185
(E-Z), BIOL 191, CBNS
150/ENTX 150

2. Statistics/Computer Science
requirement (two courses)
CS 010, CS 011/MATH 011, CS
012, CS 014, CS 021, CS 061,
CS 120A/EE 120A, CS 143/EE
143, STAT 100A, STAT 100B

3. Additional courses in biological
sciences (upper division) and
related areas from the approved
list to bring total units to 52. Eight
of these units may be from a
declared minor in one of the
science colleges, or additional
lower-division science
requirements for the teaching
credential (advisor's approval
required).

Cell, Molecular, and Developmental Biology Track

Cell, Molecular, and
Developmental Biology are
important subdisciplines in the
Biological Sciences. Students
take a series of gateway courses
and at least one upper-division

laboratory course which
acquaints them with the
basic techniques used in this
field, introduces them to
experimental design in the
laboratory, and teaches them
how to interpret laboratory
data. Students build depth in Cell,
Molecular, and Developmental
Biology by taking additional
upper-division lecture courses
from a diverse menu that may be
tailored to suit each student's
interests. Students add breadth
to their science training by
completing courses from the list
of "additional courses." Students
interested in the medical or
health science field should
choose appropriate medically
related courses from this list.
Training in this field will prepare
students for numerous
educational opportunities upon
graduation, including medical,
dental, optometry, veterinary, and
graduate school. In addition,
numerous positions are available
in teaching (for secondary level
see Biology track), business,
biotechnology, forensics, law,
biomedical and basic research,
agriculture, and government.

1. Upper-division requirements
[must include at least one
laboratory course (indicated by *)
from either category 1.b) or 2.]

a) Required courses (20–24
units)

(1) BCH 110A and BCH 110B
(recommended) or BCH 100
(2) BIOL 102, BIOL 107A, CBNS
101, CBNS 108

b) Additional requirements (a
minimum of 20 units from the
following list)

Note Credit is awarded for only
one of BIOL 109 or BCH
153/BIOL 153/BPSC 153.

(1) Cell Biology: BIOL 109*, BIOL
113, BIOL 114, BPSC 135,
CBNS 116, CBNS 120/PSYC 120

(2) Molecular Biology:
BCH 153/BIOL 153/BPSC 153*,
BIOL 107B, BIOL 115,
BIOL 155/BPSC 155

(3) Developmental Biology: BIOL
168, CBNS 169

2. Additional courses from the
following to bring total units to 52.
BCH 102*, BCH 120, BCH 162*,
BIOL 104/BPSC 104*, BIOL 110,
BIOL 119, BIOL 121/MCBL 121,
BIOL 121L/MCBL 121L*,
BIOL 123/MCBL 123/PLPA 123,
BIOL 124/MCBL 124, BIOL
128/CBNS 128,
BIOL 132/BPSC 132*, BIOL
138/BPSC 138*,

BIOL 143/BPSC 143*, BIOL
148/BPSC 148*, BIOL 161A*,
BIOL 171, BIOL 171L*, BIOL
191, CBNS 106, CBNS
120L/PSYC 120L*,
CBNS 125/PSYC 125, CBNS
150/ENTX 150,
ENTM 126L*, ENTX 101

Conservation Biology Track

Conservation biology seeks to
understand the consequences of
the rapid loss of Earth's diversity
of life and to preserve
biodiversity.

Conservation Biology is a
multidisciplinary science that
applies principles of ecology,
population genetics, evolutionary
biology, and other sciences to
solve problems related to the
loss of biodiversity.

The emergence of conservation
biology stems from the
recognition that Earth's ecological
systems face critical problems
from rapid growth of human
populations and per capita
resource consumption. A major
focus of the discipline is the study
of human impacts on biodiversity,
with special emphasis on
management processes that
prevent species extinctions and
ameliorate anthropogenic
damage to ecosystems.

People rely on a healthy bio
sphere for most of their basic
requirements for food, medicines,
chemicals, fibers, and building
materials.

Ecosystem processes are
dependent on biodiversity and
are critical for nutrient recycling,
degradation of human wastes
and pollutants, and maintenance
of the chemical composition of
the atmosphere. Biodiversity also
provides important aesthetic
benefits, as well as a vast
genetic library that provides vital
resources for the developing
enterprise of biotechnology.
Students earning a bachelor's
degree in Biological Sciences
with the Conservation Biology
track are trained to help society
understand the extent and
consequences of biodiversity
loss, and to provide objective
scientific data to resource
managers and social planners.
Students who are broadly trained
in fields relevant to Conservation
Biology, such as ecology,
population genetics, evolutionary
biology, and earth or
environmental sciences, will be

prepared for graduate study and a variety of careers in research, education or environmental consulting and management. Suggested areas of specialization include ecology, evolution and systematics, and earth or environmental sciences. Because Conservation Biology is broadly interdisciplinary, students are advised to select lower-division courses in humanities and social sciences with an eye to the prerequisite structure of upper-division courses in Geology, Environmental Sciences, Anthropology, or Economics that might form their upper-division specialization.

1. Additional lower-division requirements

a) ECON 006/ENSC 006. This course also satisfies a portion of the breadth requirements in Social Sciences.

b) GEO 002

2. Upper-division requirements

[at least 36 units from the following, including two courses with laboratory or field component (indicated by *)]

a) BIOL 102

b) BCH 100 or BCH 110A

c) STAT 100A

d) Breadth Electives (a minimum of one course from each of the following areas)

(1) Evolution and Systematics:

BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, GEO 151*

(2) Ecology: BIOL 116, BIOL 116L*, BIOL 117, BIOL 127/ENTM 127, BPSC 146*

(3) Biological Diversity:

BIOL 100/ENTM 100*, BIOL 104/BPSC 104*, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L*, BIOL 151*, BIOL 161A*, BIOL 163*, ENTM 109*, ENTM 114* (may be applied either to Biological Diversity or to Applications)

(4) Biogeography and the Physical Environment: ENSC 100/SWSC 100*, GEO 152*, GEO 153, GEO 161*, GEO 162*, GEO 168*, GEO 169*

(5) Applications: ANTH 134, ANTH 170/BPSC 170, BIOL 165/BPSC 165*, BIOL 166*, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 143C/ENSC 143C, ENTM 114* (may be applied either to Biological Diversity or to Applications), ENSC 172, ENSC 174, GEO 157*, GEO 167*

3. Specialization: 12 units of upper-division and/or substantive courses in an area of specialization chosen in consultation with a faculty advisor. A maximum of 4 units of 190-series independent study courses may be used to satisfy a portion of the specialization requirement.

4. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

Environmental Toxicology Track

The effect of environmental pollutants on human health and other biological systems, and the impact of human activity on the environment is a growing source of public concern.

Consequently, there is an increasing demand on government, industry and academia for scientists trained in a variety of environmental disciplines.

The Environmental Toxicology curriculum fills this need and provides students with a strong foundation in biology and biochemistry, as well as training in environmental toxicology. All Environmental Toxicology track students must complete a series of courses designed to provide a broad, fundamental understanding of environmental toxicology. Graduates will be positioned to pursue careers in environmental toxicology and other environmental life sciences and have the required background for entry into graduate, medical, dental, or veterinary programs.

1. Upper-division required courses (40–44 units)

a) BCH 100 or both BCH 110A and BCH 110B

b) BIOL 102, BIOL 107A or BCH 110C, CBNS 101 or BIOL 113 or BIOL 114, BIOL 116

c) CHEM 136/ENSC 136/ENTX 136 or ENSC 101, ENSC 102

d) CBNS 150/ENTX 150, ENTX 101, ENTX 154

2. Additional upper-division requirements (four courses from the following, with at least one from Chemical Fate and one from Health/Ecology)

a) Chemical Fate: CHEM 005, CHEM 109, CHEM 125, CHEM 135/ENSC 135/ENTX 135, CHEM 150A, CHEM 150B, ENVE 144/ENSC 144,

ENSC 100/SWSC 100, ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 127/SWSC 127, ENSC 140/SWSC 140, ENSC 141/MCBL 141/SWSC 141, ENSC 142, ENSC 155, ENSC 163, ENSC 172, ENSC 174, ENSC 176/SWSC 176

b) Health/Ecology: BCH 102, BCH 153/BIOL 153/BPSC 153, BCH 184, BIOL 108, BIOL 109, BIOL 115, BIOL 117, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 161A, BIOL 161B, BIOL 168, BIOL 171, BIOL 171L, CBNS 106, CBNS 169, ENTM 126, ENTM 128

3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

Evolution and Ecology Track

Evolution is the central unifying concept linking all areas of the Biological Sciences. Ecology is the study of the interrelationships and interactions between organisms and their environment that drive adaptation and dictate the distribution and abundance of organisms.

An area of specialization in Evolution and Ecology primarily serves students who are interested in entering graduate school in one of these fields or in directly entering a career in a related area, such as in an environmental consulting firm or local, state, or federal agency that deals with ecological issues. Students can focus their training to prepare themselves for further graduate study in numerous areas of the Biological Sciences, further study in a number of health related professions (medicine, dentistry, veterinary medicine, optometry), and a biological sciences career within private industry, local, state, or federal government.

1. Upper-division requirements [at least 36 units from the following, including one course with laboratory or field component (indicated by *)]

a) Required courses

(1) BCH 100

(2) BIOL 102

(3) At least three courses from BIOL 105,

BIOL 108, BIOL 112/BPSC 112/ENTM 112, BIOL 116, BIOL 160. Courses not used to meet this requirement can be applied to additional requirements.

b) Additional requirements (at least one course from each of the following areas)

(1) Biological Diversity: BIOL 100/ENTM 100*, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L*, BIOL 151*, BIOL 157*, ENTM 114*

(2) Functional Biology and Behavior:

BIOL 138/BPSC 138*, BIOL 160, BIOL 160L*, BIOL 161A*, BIOL 161B*, BIOL 162/ENTM 162, BIOL 174, BIOL 175, BIOL 178

(3) Ecology and Evolution:

BIOL 105, BIOL 108, BIOL 112/BPSC 112/ENTM 112, BIOL 116, BIOL 116L*, BIOL 117, BIOL 119, BIOL 127/ENTM 127, BIOL 148/BPSC 148, BIOL 165/BPSC 165*, BIOL 163*, BIOL 166*, BPSC 146*

2. Statistics requirement (minimum of one course) STAT 100A, STAT 100B

3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

Medical Biology Track

The Medical Biology track provides a solid foundation in science and mathematics for students who plan a career in medicine, health sciences or veterinary medicine. The track is also excellent preparation for graduate research in modern cell and molecular biology and physiology.

Although clinical courses are not part of the curriculum, the track prepares students for specific training for clinical applications in the health sciences, including medicine, veterinary medicine, osteopathic medicine, chiropractic medicine, dentistry, podiatry, optometry, pharmacy, laboratory technology, public health, nursing, physical therapy, nutrition, epidemiology, forensics, hospital administration, and physician's assistant.

Additional information and Web sites are provided below (see Suggestions for Elective Units for Medical/Health Professions, Admission Requirements for Medical and Health Professional Schools).

As can be seen from the breadth of courses included in the curriculum of the track, health sciences is a complex and diverse field with much research, new technology and opportunity. It is a major part of the economy of this country, and there is a continuing need for motivated and well-trained workers, teachers, practitioners and researchers in all aspects of the field.

1. Upper-division requirements [at least 52 units from the following, including two courses with laboratory or field component (indicated by *)]

a) Cell/Molecular

(1) Required courses (15–20 units)

BCH 100 or both BCH 110A and BCH 110B

BIOL 102 or BIOL 115

CBNS 101 or BIOL 113 or BIOL 114

BIOL 107A or BCH 110C

(2) Elective options: BCH 102*, BCH 110B, BCH 110C, BIOL 107B, BIOL 109*, BIOL 155/BPSC 155

b) Physiology/Anatomy (minimum of two courses with lecture component):

BCH 120, BIOL 161A*, BIOL 161B*, BIOL 171, BIOL 171L*, BIOL 174, BIOL 175, BIOL 178

c) Neuroscience/Pharmacology (minimum of one course with lecture component):

CBNS 106, CBNS 116, CBNS 120/PSYC 120, CBNS 120L/PSYC 120L*, CBNS 124/PSYC 124, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127, ENTX 101

d) Pathogenesis (minimum of two courses with lecture component)

(1) Required course: BIOL 121/MCBL 121

(2) Elective options:

BIOL 121L/MCBL 121L*, BIOL 122/MCBL 122, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L*, BIOL 159/NEM 159, BIOL 157*, CBNS 150/ENTX 150, ENTM 126, ENTM 126L*

e) Genomics/Bioinformatics (minimum of one course): BIOL 107B, BIOL 109* or BCH 153/BIOL 153/BPSC 153* or

BCH 162*, BIOL 119, BPSC 148

f) Immunology (elective option): BIOL 128/CBNS 128

g) Development/Embryology (elective options): BIOL 168, CBNS 169

h) Additional elective courses to bring total units to 52:

ANTH 170/BPSC 170, BIOL 100/ENTM 100*, BIOL 104/BPSC 104*, BIOL 105, BIOL 108, BIOL 110, BIOL 116, BIOL 116L*, BIOL 151*, BIOL 160, BIOL 160L*, CHEM 109, CS 010, STAT 100B

Microbiology Track

Microorganisms are ubiquitous from the stratosphere to the depths of the ocean. They encompass the greatest metabolic diversity of all life forms. Many are important in conversion of food products, and more yet, in their spoilage. Some produce important medicinal products, while others, the most potent toxins known. Many are beneficial as symbionts to animals and plants, yet others effect their demise. Students earning a B.S. degree in Biological Sciences with the Microbiology track will be trained for technical careers in a broad spectrum of the medicinal, agricultural, biotechnology, and environmental fields as consultants and technicians. Students specializing in the Microbiology track will also be prepared to continue studies at the graduate level, earn teaching credentials, or enter professional schools in medicine, dentistry, or veterinary medicine.

1. Upper-division core requirements (31–32 units)

a) BCH 110A, BCH 110B; BCH 110C or BIOL 107A

b) BIOL 102 or BIOL 115, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 157

c) BIOL 123/MCBL 123/PLPA 123

2. Additional upper-division requirements (at least three courses from the following)

BIOL 107B, BIOL 109, BIOL 113, BIOL 114, BIOL 120/MCBL 120/PLPA 120,

BIOL 122/MCBL 122, BIOL 124/MCBL 124, BIOL 128/CBNS 128, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L, BIOL 159/NEM 159, CBNS 101, ENSC 141/MCBL 141/SWSC 141, ENSC 155

3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

Plant Biology Track

The track in Plant Biology is built on the premise that students with training in plant biology fill unique and diverse niches in academia, industry, medicine, business, law, biotechnology, government and agriculture. The track is a flexible one that can be tailored to an individual's interests and career goals. Students should consult with a faculty advisor to clarify educational goals and to plan an appropriate program of study. The Plant Biology track can prepare students for a wide array of graduate or professional training programs or employment positions in the fields of agronomy, biochemistry, biotechnology, botany, cell biology, conservation biology, developmental biology, ecology, ethnobotany, evolution, dentistry, genetics, horticulture, medicine, molecular biology, plant breeding, plant pathology, plant physiology, systematics, and veterinary medicine. While Plant Biology is not considered a traditional track for students who plan careers in medicine, veterinary medicine, or dentistry, professional schools may view the individuality of training in plant biology as an asset.

Notes BCH 110A is strongly recommended.

1. Upper-division core requirements (28-32 units)
 - a) BIOL 102
 - b) BPSC 104/BIOL 104 (may be waived with consent of the faculty advisor)
 - c) BIOL 132/BPSC 132, BIOL 143/BPSC 143, BPSC 133
 - d) At least 8 units from the following:
BIOL 100/ENTM 100, BIOL 120/MCBL 120/PLPA 120, BIOL 120L/MCBL 120L/PLPA 120L, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L, BIOL 159/NEM 159, BPSC 134/ENSC 134/SWSC 134, ENSC 120/NEM 120/SWSC 120, ENTM 124
 - e) Two (2) units of BPSC 195H, BPSC 197, BPSC 198-I, or BPSC 199
2. Additional upper-division requirements (20 units must come from one of the following four areas of specialization)
 - a) Plant Cellular, Molecular, and Developmental Biology
(1) BPSC 135

(2) Additional units from the following to meet the B.S. requirement:

BCH 102, BCH 110B, BCH 110C or BIOL 107A, BCH 153/BIOL 153/BPSC 153, BCH 162, BCH 183, BIOL 107B, BIOL 113, BIOL 114, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL123/PLPA 123, BIOL 155/BPSC 155, BIOL 168, CBNS 101, CBNS 108

b) Plant Genetics, Breeding, and Biotechnology

(1) BPSC 150

(2) Additional units from the following to meet the B.S. requirement:

BCH 153/BIOL 153/BPSC 153, BIOL 105, BIOL 107A, BIOL 107B, BIOL 108, BIOL 109, BIOL 119, BIOL 148/BPSC 148, BIOL 155/BPSC 155, BPSC 135, BPSC 158, CBNS 108

c) Ecology, Evolution, and Systematics

(1) BPSC 146

(2) Additional units from the following to meet the B.S. requirement:

ANTH 170/BPSC 170, BIOL 105, BIOL108, BIOL 112/BPSC 112/ ENTM 112, BIOL 116, BIOL 116L, BIOL 117, BIOL 138/BPSC 138, BIOL 165/BPSC 165, BPSC 134/ENSC 134/SWSC 134, BPSC 158, BPSC 166, ENSC 100/SWSC 100, GEO 151

d) Plant Pathology, Nematology, and Pest Management

(1) BIOL 120/MCBL 120/PLPA 120

(2) Additional units from the following to meet the B.S. requirement:

BCH 183, BIOL 100/ENTM 100, BIOL 120/MCBL 120/PLPA 120, BIOL 120L/MCBL 120L/PLPA 120L, BIOL 121/MCBL 121, BIOL 121L/MCBL 121L, BIOL 123/MCBL 123/PLPA 123, BIOL 124/MCBL 124, BIOL 127/ENTM 127, BIOL 134/PLPA 134, BIOL 134L/PLPA 134L, BIOL 159/NEM 159, BPSC 133, BPSC 146, BPSC 150, BPSC 158, BPSC 166, ENSC 104/SWSC 104, ENTM 109, ENTM 124, ENTM 129, ENTM 129L, ENSC 100/SWSC 100, ENSC 120/NEM 120/SWSC 120

3. Additional upper-division courses in biological sciences and related areas from any of the above lists, and students may apply a maximum of six units of BPSC 190 and/or BPSC 197 and/or BPSC 198-I and/or BPSC 199 to bring total units to 52.