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**PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR)**

**SUBMITTED BY:**

Department	<b>Biology &amp; Wildlife</b>	College/School	<b>CNSM</b>
Prepared by	<b>Diane Wagner</b>	Phone	<b>474-5493</b>
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See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

**PROGRAM IDENTIFICATION:**

<b>DEGREE PROGRAM</b>	<b>Biological Sciences</b>
<b>Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)</b>	<b>BS and BA</b>

**A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)**

**Major changes:**

1. Change the capstone project requirement, as decided by faculty in May 2014. The old rule was that a student could fulfill the capstone requirement by passing a designated capstone class with C or better. The new rule is that the student must achieve a passing grade on the capstone project itself in order to receive credit for the capstone project. The capstone project may be completed within a designated capstone class (or through more independent means) but the student may pass the class and fail to meet the capstone project requirement, or vice versa.
2. Change the minimum grade to C- for the BA and BS programs.

**More minor changes**

1. Add a course to the list of capstone courses.
2. Allow students to complete the physics requirement of the BS degree by taking PHYS 211X and 212X, as well as PHYS 103X and 104X.
3. Correct a mistake in the BS Cell and Molecular Biology Concentration requirements.
4. Update the electives course list.

**B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:**

**Biological Sciences**

College of Natural Science and Mathematics  
 Department of Biology and Wildlife  
 907-474-7671  
[www.bw.uaf.edu](http://www.bw.uaf.edu)

[BA](#), [BS](#), [MS](#), [PhD](#) Degrees; [Minor](#)

[Downloadable PDF](#)

Minimum Requirements for Degrees: 120 credits

Biological sciences is an appropriate major for students interested in the science of life. Programs in these fields provide a broad education and a foundation in the basic principles of biology. Graduates are employed in environmental science, health services, biology education, and as field and laboratory technicians. Graduates may also pursue advanced MS, pharmacology, nursing, MD or PhD degrees. Biology faculty advisors can help students choose courses that will best fit their goals.

Biological sciences majors may pursue either a BA or BS degree. Because biology is an interdisciplinary science, both programs include course work in the physical sciences and mathematics. The BA requires fewer

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credits in biology and more credits in the social sciences and humanities than the BS degree, which focuses more intensively on biological science. The BS degree without a concentration provides the most comprehensive education in biology. The BS degree with a concentration permits some degree of specialization in one of three sub-disciplines: cell and molecular biology, physiology, or ecology and evolutionary biology.

Incoming students who do not meet the prerequisites for Fundamentals of Biology I (BIOL F115X) and those who did not complete a biology course in high school are encouraged to take a biology course for non-majors such as Biology and Society (BIOL F103X) or Natural History of Alaska (BIOL F104X) and General Chemistry I and II (CHEM F105X and CHEM F106X) during their first year, and to begin the BIOL F115X and F116X series in their sophomore year. Students unprepared for General Chemistry I (CHEM F105X) should take Basic General Chemistry (CHEM F103X) during their first year, and begin both the General Chemistry (CHEM F105X and F106X) and Fundamentals of Biology Series (BIOL F115X and F116X) during their sophomore year.

Students majoring in the biological sciences must complete a capstone project during their junior or senior year. The goal of the capstone experience is to integrate skills and information students have learned in previous courses by conducting a mentored research project and communicating the results. To fulfill the capstone requirement, a student may take either a designated capstone course or complete a mentored research project with a faculty member and petition the Biology and Wildlife chair to have this research experience count toward the capstone requirement. Biology course credit for mentored research may be obtained by completing BIOL F490, F397, or F497. More information about the capstone requirement is posted on the Biology and Wildlife website ([www.bw.uaf.edu](http://www.bw.uaf.edu)). Students are strongly encouraged to speak to a biology advisor well before their senior year about how they plan to satisfy the capstone requirement.

#### Major -- BA Degree

1. Complete the [general university requirements](#). (As part of the core curriculum requirements, complete: CHEM F105X\* and F106X\*.)
2. Complete the [BA degree requirements](#). As part of the BA degree requirements, complete STAT F200X\*. As part of the humanities and social sciences requirement, take at least 9 credits of upper-division course work. As part of the minor, take at least 3 credits of upper-division course work.
3. Complete the following program (major) requirements:\*
- 3.1. Complete the following:
  - BIOL F115X--Fundamentals of Biology I--4 credits
  - BIOL F116X--Fundamentals of Biology II--4 credits
  - BIOL F260--Principles of Genetics--4 credits
  - BIOL F481--Principles of Evolution--4 credits
  - CHEM F321--Organic Chemistry --4 credits
  - PHYS F103X--College Physics--4 credits
- 3.2. Complete two of the following three biology breadth requirements:\*\*
  - BIOL F310--Animal Physiology (4)
  - or BIOL F342--Microbiology (4)
  - or BIOL F434W--Structure and Function of Vascular Plants (4)
  - or BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)--4 - 8 credits
  - BIOL F360--Cell and Molecular Biology--3 credits
  - BIOL F371--Principles of Ecology--4 credits
- 3.3. Complete three elective courses from course lists A, B, C or D below, at least one of which is designated a W course.\*\*\* If possible, satisfy all UAF core requirements for W and O courses and the biology capstone requirement with these elective courses.
- 3.4. Complete a biology capstone project (no credit requirement):

The capstone requirement can be met through a petition following the completion of a mentored research project with a faculty member (e.g., by taking BIOL F490, or BIOL F497, or without course credits), or by completing at least one of the following courses:

  - BIOL F403W--Metabolism and Biochemistry (4)
  - or BIOL F434W--Plant Structure and Function of Vascular Plants (4)
  - or BIOL F441W,O/2--Animal Behavior (3)
  - or BIOL F472W--Community Ecology (4)
  - or BIOL F473W--Limnology (3)--3 - 4 credits
4. Minimum credits required--120 credits



### Major -- BS Degree without concentration

1. Complete the [general university requirements](#). (As part of the core curriculum requirements, complete: MATH F200X\* or MATH F272X\*; and CHEM F105X\* and F106X\*.)
2. Complete the [BS degree requirements](#). (As part of the BS degree requirements, complete STAT F200X\* or STAT F300\* and PHYS F103X\* and PHYS F104X\*.)
3. Complete the following program (major) requirements: \*  
BIOL F115X--Fundamentals of Biology I--4 credits  
BIOL F116X--Fundamentals of Biology II--4 credits  
BIOL F260--Principles of Genetics--4 credits  
BIOL F360--Cell and Molecular Biology--3 credits  
BIOL F371--Principles of Ecology--4 credits  
BIOL F310--Animal Physiology (4)  
or BIOL F342--Microbiology (4)  
or BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)  
or BIOL F434W--Structure and Function of Vascular Plants (4)--4 - 8 credits  
BIOL F481--Principles of Evolution--4 credits  
CHEM F321--Organic Chemistry I (4)  
and either CHEM F322--Organic Chemistry II( 3)  
or CHEM F451--General Biochemistry -- Metabolism (3)--3 - 4 credits
4. Complete the following electives (at least one must satisfy the W requirement): \*\*\*  
Organismal elective:  
Complete one additional course from list D--3 - 4 credits  
Biology electives:  
Complete four additional courses at the 200 level or above, at least three of which must be from lists A, B, C or D 2 - 16
5. Complete a biology capstone project (no credit requirement):  
The capstone requirement can be met through a petition following the completion of a mentored research project with a faculty member (e.g., by taking BIOL F490, or BIOL F497, or without course credits), or by completing at least one of the following courses:  
BIOL F403W--Metabolism and Biochemistry (4)  
or BIOL F434W--Structure and Function of Vascular Plants (4)  
or BIOL F441W,O/2--Animal Behavior (3)  
or BIOL F472W--Community Ecology (4)  
or BIOL F473W--Limnology (3)
6. Minimum credits required--120 credits

### Major -- BS Degree with concentration

1. Complete the [general university requirements](#). (As part of the core curriculum requirements, complete: MATH F200X\* or MATH F272X\*; and CHEM F105X\* and F106X\*.)
2. Complete the [BS degree requirements](#). (As part of the BS degree requirements, complete STAT F200X\* or STAT F300\* and PHYS F103X\* and PHYS F104X\*.)
3. Complete the following program (major) requirements: \*  
BIOL F115X--Fundamentals of Biology I--4 credits  
BIOL F116X--Fundamentals of Biology II--4 credits  
BIOL F260--Principles of Genetics--4 credits  
BIOL F310--Animal Physiology (4)  
or BIOL F434W--Structure and Function of Vascular Plants (4)  
or BIOL F342--Microbiology (4)  
or BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)--4 - 8 credits  
BIOL F481--Principles of Evolution--4 credits  
CHEM F321--Organic Chemistry I (4)  
and either CHEM F322--Organic Chemistry II (3)  
or CHEM F451--General Biochemistry -- Metabolism (3)--3 - 4 credits
4. Complete one of the following concentrations: \*\*\*.  
(When choosing courses to fulfill concentration requirements, students should consider the university requirement for two W courses and one O course, and the departmental requirement for a capstone project.)
  1. Cell and Molecular Biology
    - i. As part of the program requirements, complete CHEM F321.

- ii. Complete the following (at least one of which must satisfy the W requirement):  
 BIOL F360--Cell and Molecular Biology--3 credits  
 CHEM F450--General Biochemistry -- Macromolecules--3 credits  
 CHEM F451--General Biochemistry -- Metabolism--3 credits  
 Cell and molecular and physiology electives:  
 Take three additional courses from lists A or B, at least one of which must be from list A.--9 - 12 credits  
 Biology breadth elective:  
 Take one additional course from lists C or D--3 - 4 credits
2. Physiology  
 Complete the following (at least one of which must satisfy the W requirement):  
 BIOL F360--Cell and Molecular Biology--3 credits  
 Physiology or cell and molecular biology electives:  
 Take two courses from list A and two from list B--12 - 16 credits  
 Biology breadth elective:  
 Take one additional course from lists C or D--3 - 4 credits  
 Biology elective:  
 Take one additional course from lists A, B, C or D--3 - 4 credits
3. Ecology and Evolutionary Biology  
 Complete the following (at least one of which must satisfy the W requirement):  
 BIOL F371--Principles of Ecology--4 credits  
 Ecology and evolutionary biology electives:  
 Take two additional courses from list C--6 - 8 credits  
 Organismal elective:  
 Take one additional course from list D--3 - 4 credits  
 Biology breadth elective:  
 Take one additional course from lists A or B--3 - 4 credits  
 Biology elective:  
 Take one additional course from lists A, B, C or D--3 - 4 credits  
 STAT F401--Regression and Analysis of Variance (4)  
 or STAT F402--Scientific Sampling (3)--3 - 4 credits
5. Complete a biology capstone project (no credit requirement):  
 The capstone requirement can be met through a petition following the completion of a mentored research project with a faculty member (e.g., by taking BIOL F490, or BIOL F497, with or without course credits), or by completing at least one of the following courses:  
 BIOL F403W--Metabolism and Biochemistry (4)  
 or BIOL F434W--Structure and Function of Vascular Plants (4)  
 or BIOL F441W,O/2--Animal Behavior (3)  
 or BIOL F472W--Community Ecology (4)  
 or BIOL F473W--Limnology (3)--3 - 4 credits
6. Minimum credits required--120 credits

**Biology elective course lists:\*\*\*\***

- **List A -- Cell and Molecular Biology**  
 BIOL F342--Microbiology--3 credits  
 BIOL F360--Cell and Molecular Biology--3 credits  
 BIOL F403W--Metabolism and Biochemistry--4 credits  
 BIOL F417O--Neurobiology--3 credits  
BIOL 435—Biology of Cancer—3 credits  
BIOL 460—Principles of Virology—3 credits  
 BIOL F462O--Concepts of Infectious Disease--3 credits  
 BIOL F465--Immunology--3 credits  
 CHEM F322--Organic Chemistry II--3 credits  
 CHEM F450--General Biochemistry -- Macromolecules--3 credits  
 CHEM F451--General Biochemistry -- Metabolism--3 credits  
 CHEM F470--Cellular and Molecular Neuroscience--3 credits  
 CHEM F474--Neurochemistry--3 credits
- **List B -- Physiology**  
 BIOL F310--Animal Physiology--4 credits



BIOL F317--Comparative Anatomy--4 credits  
BIOL F335--Epidemiology--3 credits  
BIOL F342--Microbiology--4 credits  
BIOL F417O--Neurobiology--3 credits  
BIOL F422--Physiology and Ecology of Overwintering--3 credits  
BIOL F434W--Structure and Function in Vascular Plants--4 credits  
BIOL F441W,O/2--Animal Behavior--3 credits  
BIOL F455W,O--Environmental Toxicology--3 credits  
BIOL F457W,O--Environmental Microbiology--3 credits  
BIOL F458--Vertebrate Endocrinology--3 credits  
BIOL F459O/2--Wildlife Nutrition--4 credits  
BIOL F462O--Concepts of Infectious Disease--3 credits  
BIOL F465--Immunology--3 credits

- **List C -- Ecology and Evolutionary Biology**

BIOL F371--Principles of Ecology--4 credits  
BIOL F418--Biogeography--3 credits  
BIOL F433--Conservation Genetics--3 credits  
BIOL F441W,O/2--Animal Behavior--3 credits  
BIOL F457W--Environmental Microbiology--3 credits  
BIOL F462O--Concepts of Infectious Disease--3 credits  
BIOL F469O--Landscape Ecology and Wildlife Habitat--3 credits  
BIOL F471--Population Ecology--3 credits  
BIOL F472W--Community Ecology--3 credits  
BIOL F473W--Limnology--3 credits  
BIOL F474--Plant Ecology--4 credits  
BIOL F476O--Ecosystem Ecology--3 credits  
BIOL F483--Stream Ecology--3 credits  
BIOL F485--Global Change Ecology--3 credits  
BIOL F486--Vertebrate Paleontology--3 credits  
BIOL F487--Conceptual Issues in Evolutionary Biology--3 credits  
BIOL F488--Arctic Vegetation Ecology: Geobotany--3 credits  
BIOL F489--Vegetation Description and Analysis--3 credits  
WLF F301--Design of Wildlife Studies--3 credits  
WLF F410--Wildlife Populations and their Management--3 credits

### **Minor**

Complete the following program (minor) requirements:\*

BIOL F115X--Fundamentals of Biology I--4 credits  
BIOL F116X--Fundamentals of Biology II--4 credits  
BIOL F260--Principles of Genetics--4 credits

1. Complete one of the following course options:\*\*\*\*  
BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)  
or BIOL F310--Animal Physiology (4)  
or BIOL F342--Microbiology (4)  
or BIOL F360--Cell and Molecular Biology (3)  
or BIOL F371--Principles of Ecology (4)  
or BIOL F434W--Structure and Function of Vascular Plants (4)  
or BIOL F481--Principles of Evolution (4)--3 - 8 credits
2. Complete one additional course in biology at the 200-level or above--3 credits
3. Minimum credits required--18 credits

\* Students must earn a C or better in each course.

\*\* Because biology breadth courses for the BA degree serve as prerequisites for many upper-division biology electives, course choices should be made with consideration of the elective biology courses the student plans to complete.



\*\*\* Independent study (BIOL F397 or F497) or research experience (URSA F388 and F488, and BIOL F490) courses may be substituted by petition for a maximum of two required elective courses in biology (3 - 4 credits of independent study or research per substituted course). The subject area of the independent study or research will determine which biological subject areas the credits satisfy.

\*\*\*\* Courses that satisfy upper-division elective credit may require prerequisites in addition to the required biology course.'

Note: A foreign language is encouraged by the department in meeting requirements of the core curriculum.

**C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:**  
(Underline new wording ~~strike-through-old-wording~~ and use complete catalog format )

## **Biological Sciences**

College of Natural Science and Mathematics  
Department of Biology and Wildlife  
907-474-7671  
[www.bw.uaf.edu](http://www.bw.uaf.edu)

[BA](#), [BS](#), [MS](#), [PhD](#) Degrees; [Minor](#)

[Downloadable PDF](#)

Minimum Requirements for Degrees: 120 credits

Biological sciences is an appropriate major for students interested in the science of life. Programs in these fields provide a broad education and a foundation in the basic principles of biology. Graduates are employed in environmental science, health services, biology education, and as field and laboratory technicians. Graduates ~~may~~ also pursue advanced MS, pharmacology, nursing, MD or PhD degrees. Biology faculty advisors can help students choose courses that will best fit their goals.

Biological sciences majors may pursue either a BA or BS degree. Because biology is an interdisciplinary science, both programs include course work in the physical sciences and mathematics. The BA requires fewer credits in biology and more credits in the social sciences and humanities than the BS degree, which focuses more intensively on biological science. The BS degree without a concentration provides the most comprehensive education in biology. The BS degree with a concentration permits some degree of specialization in one of three sub-disciplines: cell and molecular biology, physiology, or ecology and evolutionary biology.

Incoming students who do not meet the prerequisites for Fundamentals of Biology I (BIOL F115X) and those who did not complete a biology course in high school are encouraged to take a biology course for non-majors such as Biology and Society (BIOL F103X) or Natural History of Alaska (BIOL F104X) and General Chemistry I and II (CHEM F105X and CHEM F106X) during their first year, and to begin the BIOL F115X and F116X series in their sophomore year. Students unprepared for General Chemistry I (CHEM F105X) ~~should be encouraged to take Basic General Chemistry (CHEM F103X) beforehand during their first year, and begin both the General Chemistry (CHEM F105X and F106X) and Fundamentals of Biology Series (BIOL F115X and F116X) during their sophomore year.~~

Students majoring in the biological sciences must complete a capstone project during their junior or senior year. The goal of the capstone experience is to integrate skills and information students have learned in previous courses by conducting a mentored research project and communicating the results. ~~Students may complete a capstone project within a designated capstone course or by working individually with a faculty mentor. In either case, a passing grade on the capstone project itself is required to satisfy the capstone requirement. To fulfill the capstone requirement, a student may take either a designated capstone course or complete a mentored research project with a faculty member and petition the Biology and Wildlife chair to have this research experience count toward the capstone requirement.~~ Biology course credit for individualized mentored research ~~may be obtained by completing~~ is available as BIOL F490, F397, or F497. More information about the capstone requirement is posted on the Biology and Wildlife website ([www.bw.uaf.edu](http://www.bw.uaf.edu)). Students are strongly encouraged to speak to a



biology advisor well before their senior year about how they plan to satisfy the capstone requirement.

### Major -- BA Degree

1. Complete the [general university requirements](#). (As part of the core curriculum requirements, complete: CHEM F105X\* and F106X\*.)
  2. Complete the [BA degree requirements](#). As part of the BA degree requirements, complete STAT F200X\*. As part of the humanities and social sciences requirement, take at least 9 credits of upper-division course work. As part of the minor, take at least 3 credits of upper-division course work.
  3. Complete the following program (major) requirements:\*
  - 3.1. Complete the following:
    - BIOL F115X--Fundamentals of Biology I--4 credits
    - BIOL F116X--Fundamentals of Biology II--4 credits
    - BIOL F260--Principles of Genetics--4 credits
    - BIOL F481--Principles of Evolution--4 credits
    - CHEM F321--Organic Chemistry --4 credits
    - PHYS F103X--College Physics--4 credits
  - 3.2. Complete two of the following three biology breadth requirements:\*\*
    - BIOL F310--Animal Physiology (4)
      - or BIOL F342--Microbiology (4)
      - or BIOL F434W--Structure and Function of Vascular Plants (4)
      - or BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)--4 - 8 credits
    - BIOL F360--Cell and Molecular Biology--3 credits
    - BIOL F371--Principles of Ecology--4 credits
  - 3.3. Complete three elective courses from course lists A, B, C or D below, at least one of which is designated a W course.\*\*\* If possible, satisfy all UAF core requirements for W and O courses and the biology capstone requirement with these elective courses.
  - 3.4. Complete a biology capstone project (no credit requirement):  
The capstone requirement [requires satisfactory performance of a research project conducted either individually with mentorship by](#) a faculty member (e.g., by taking BIOL F490, or BIOL F497, or without course credits), or [within by completing at least](#) one of the following courses:
    - BIOL F403W--Metabolism and Biochemistry (4)
      - or BIOL F434W--Plant Structure and Function of Vascular Plants (4)
      - or BIOL F441W,O/2--Animal Behavior (3)
      - or [BIOL F459O/2--Wildlife Nutrition \(4\)](#)
        - or BIOL F472W--Community Ecology (4)
        - or BIOL F473W--Limnology (3)--3 - 4 credits
4. Minimum credits required--120 credits

### Major -- BS Degree without concentration

1. Complete the [general university requirements](#). (As part of the core curriculum requirements, complete: MATH F200X\* or MATH F272X\*; and CHEM F105X\* and F106X\*.)
2. Complete the [BS degree requirements](#). (As part of the BS degree requirements, complete STAT F200X\* or STAT F300\* and either PHYS F103X\* and PHYS F104X\* [or PHYS F211X\\* and PHYS F212X\\*](#).)
3. Complete the following program (major) requirements:\*
- BIOL F115X--Fundamentals of Biology I--4 credits
- BIOL F116X--Fundamentals of Biology II--4 credits
- BIOL F260--Principles of Genetics--4 credits
- BIOL F360--Cell and Molecular Biology--3 credits
- BIOL F371--Principles of Ecology--4 credits
- BIOL F310--Animal Physiology (4)
  - or BIOL F342--Microbiology (4)
  - or BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)
  - or BIOL F434W--Structure and Function of Vascular Plants (4)--4 - 8 credits
- BIOL F481--Principles of Evolution--4 credits
- CHEM F321--Organic Chemistry I (4)
  - and either CHEM F322--Organic Chemistry II (3)
  - or CHEM F451--General Biochemistry -- Metabolism (3)--3 - 4 credits

4. Complete the following electives (at least one must satisfy the W requirement):\*\*\*  
 Organismal elective:  
 Complete one additional course from list D--3 - 4 credits  
 Biology electives:  
 Complete four additional courses at the 200 level or above, at least three of which must be from lists A, B, C or D 2 - 16
5. Complete a biology capstone project (no credit requirement):  
 The capstone requirement requires satisfactory performance of a research project conducted either individually with mentorship by a faculty member (e.g., by taking BIOL F490, or BIOL F497, or without course credits), or within by completing at least one of the following courses:  
 BIOL F403W--Metabolism and Biochemistry (4)  
 or BIOL F434W--Plant Structure and Function of Vascular Plants (4)  
 or BIOL F441W,O/2--Animal Behavior (3)  
 or BIOL F459O/2--Wildlife Nutrition (4)  
 or BIOL F472W--Community Ecology (4)  
 or BIOL F473W--Limnology (3)--3 - 4 credits
6. Minimum credits required--120 credits

#### Major -- BS Degree with concentration

1. Complete the general university requirements. (As part of the core curriculum requirements, complete: MATH F200X\* or MATH F272X\*; and CHEM F105X\* and F106X\*.)
2. Complete the BS degree requirements. (As part of the BS degree requirements, complete STAT F200X\* or STAT F300\* and PHYS F103X\* and PHYS F104X\* or PHYS F211X\* and PHYS F212X\*.)
3. Complete the following program (major) requirements:\*  
 BIOL F115X--Fundamentals of Biology I--4 credits  
 BIOL F116X--Fundamentals of Biology II--4 credits  
 BIOL F260--Principles of Genetics--4 credits  
 BIOL F310--Animal Physiology (4)  
 or BIOL F434W--Structure and Function of Vascular Plants (4)  
 or BIOL F342--Microbiology (4)  
 or BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)--4 - 8 credits  
 BIOL F481--Principles of Evolution--4 credits  
 CHEM F321--Organic Chemistry I (4)  
 and either CHEM F322--Organic Chemistry II (3)  
 or CHEM F451--General Biochemistry -- Metabolism (3)--3 - 4 credits
4. Complete one of the following concentrations:\*\*\*.  
 (When choosing courses to fulfill concentration requirements, students should consider the university requirement for two W courses and one O course, and the departmental requirement for a capstone project.)
  - a. **Cell and Molecular Biology**
    - i. As part of the program requirements, complete CHEM F321+2.
    - ii. Complete the following (at least one of which must satisfy the W requirement):  
 BIOL F360--Cell and Molecular Biology--3 credits  
 CHEM F450--General Biochemistry -- Macromolecules--3 credits  
 CHEM F451--General Biochemistry -- Metabolism--3 credits  
 Cell and molecular and physiology electives:  
 Take three additional courses from lists A or B, at least one of which must be from list A.--9 - 12 credits  
 Biology breadth elective:  
 Take one additional course from lists C or D--3 - 4 credits
  - b. **Physiology**  
 Complete the following (at least one of which must satisfy the W requirement):  
 BIOL F360--Cell and Molecular Biology--3 credits  
 Physiology or cell and molecular biology electives:  
 Take two courses from list A and two from list B--12 - 16 credits  
 Biology breadth elective:  
 Take one additional course from lists C or D--3 - 4 credits  
 Biology elective:



- Take one additional course from lists A, B, C or D--3 - 4 credits
- c. **Ecology and Evolutionary Biology**  
 Complete the following (at least one of which must satisfy the W requirement):  
 BIOL F371--Principles of Ecology--4 credits  
 Ecology and evolutionary biology electives:  
 Take two additional courses from list C--6 - 8 credits  
 Organismal elective:  
 Take one additional course from list D--3 - 4 credits  
 Biology breadth elective:  
 Take one additional course from lists A or B--3 - 4 credits  
 Biology elective:  
 Take one additional course from lists A, B, C or D--3 - 4 credits  
 STAT F401--Regression and Analysis of Variance (4)  
 or STAT F402--Scientific Sampling (3)--3 - 4 credits
5. Complete a biology capstone project (no credit requirement):  
 The capstone requirement requires satisfactory performance of a research project conducted either individually with mentorship by a faculty member (e.g., by taking BIOL F490, or BIOL F497, or without course credits), or within by completing at least one of the following courses:  
 BIOL F403W--Metabolism and Biochemistry (4)  
 or BIOL F434W--Plant Structure and Function of Vascular Plants (4)  
 or BIOL F441W,O/2--Animal Behavior (3)  
 or BIOL F459O/2—Wildlife Nutrition (4)  
 or BIOL F472W--Community Ecology (4)  
 or BIOL F473W--Limnology (3)--3 - 4 credits
6. Minimum credits required--120 credits

**Biology elective course lists:\*\*\*\***

- **List A -- Cell and Molecular Biology**  
 BIOL F342--Microbiology--3 credits  
 BIOL F360--Cell and Molecular Biology--3 credits  
 BIOL F403W--Metabolism and Biochemistry--4 credits  
 BIOL F417O--Neurobiology--3 credits  
 BIOL F435—Biology of Cancer—3 credits  
 BIOL F460—Principles of Virology—3 credits  
 BIOL F462O--Concepts of Infectious Disease--3 credits  
 BIOL F465--Immunology--3 credits  
BIOL F4XX—Advanced Cell and Molecular Biology Laboratory—3 credits  
 CHEM F322--Organic Chemistry II--3 credits  
 CHEM F450--General Biochemistry -- Macromolecules--3 credits  
 CHEM F451--General Biochemistry -- Metabolism--3 credits  
 CHEM F470--Cellular and Molecular Neuroscience--3 credits  
 CHEM F474--Neurochemistry--3 credits
- **List B -- Physiology**  
 BIOL F310--Animal Physiology--4 credits  
~~BIOL F317--Comparative Anatomy--4 credits~~  
 BIOL F335--Epidemiology--3 credits  
 BIOL F342--Microbiology--4 credits  
 BIOL F417O--Neurobiology--3 credits  
 BIOL F422--Physiology and Ecology of Overwintering--3 credits  
 BIOL F434W--Structure and Function in Vascular Plants--4 credits  
 BIOL F441W,O/2--Animal Behavior--3 credits  
 BIOL F455W,O--Environmental Toxicology--3 credits  
 BIOL F457W,O--Environmental Microbiology--3 credits  
 BIOL F458--Vertebrate Endocrinology--3 credits  
 BIOL F459O/2--Wildlife Nutrition--4 credits  
 BIOL F462O--Concepts of Infectious Disease--3 credits  
 BIOL F465--Immunology--3 credits  
BIOL F4XX—Exercise Physiology—3 credits

- **List C -- Ecology and Evolutionary Biology**
  - BIOL F371--Principles of Ecology--4 credits
  - BIOL F418--Biogeography--3 credits
  - BIOL F433--Conservation Genetics--3 credits
  - BIOL F441W,O/2--Animal Behavior--3 credits
  - BIOL F457W--Environmental Microbiology--3 credits
  - ~~BIOL F462O--Concepts of Infectious Disease--3 credits~~
  - BIOL F469O--Landscape Ecology and Wildlife Habitat--3 credits
  - BIOL F471--Population Ecology--3 credits
  - BIOL F472W--Community Ecology--3 credits
  - BIOL F473W--Limnology--3 credits
  - BIOL F474--Plant Ecology--4 credits
  - BIOL F476O--Ecosystem Ecology--3 credits
  - BIOL F483--Stream Ecology--3 credits
  - BIOL F485--Global Change Ecology--3 credits
  - BIOL F486--Vertebrate Paleontology--3 credits
  - BIOL F487--Conceptual Issues in Evolutionary Biology--3 credits
  - BIOL F488--Arctic Vegetation Ecology: Geobotany--3 credits
  - BIOL F489--Vegetation Description and Analysis--3 credits
  - WLF F301--Design of Wildlife Studies--3 credits
  - WLF F410--Wildlife Populations and their Management--3 credits Minor

4. Complete the following program (minor) requirements:\*
  - BIOL F115X--Fundamentals of Biology I--4 credits
  - BIOL F116X--Fundamentals of Biology II--4 credits
  - BIOL F260--Principles of Genetics--4 credits
5. Complete one of the following course options:\*\*\*\*
  - BIOL F213X and F214X--Human Anatomy and Physiology I and II (8)
    - or BIOL F310--Animal Physiology (4)
    - or BIOL F342--Microbiology (4)
    - or BIOL F360--Cell and Molecular Biology (3)
    - or BIOL F371--Principles of Ecology (4)
    - or BIOL F434W--Structure and Function of Vascular Plants (4)
    - or BIOL F481--Principles of Evolution (4)--3 - 8 credits
6. Complete one additional course in biology at the 200-level or above--3 credits
7. Minimum credits required--18 credits

\* Students must earn a **C-** or better in each course.

\*\* Because biology breadth courses for the BA degree serve as prerequisites for many upper-division biology electives, course choices should be made with consideration of the elective biology courses the student plans to complete.

\*\*\* Independent study (BIOL F397 or F497) or research experience (URSA F388 and F488, and BIOL F490) courses may be substituted by petition for a maximum of two required elective courses in biology (3 - 4 credits of independent study or research per substituted course). The subject area of the independent study or research will determine which biological subject areas the credits satisfy.

\*\*\*\* Courses that satisfy upper-division elective credit may require prerequisites in addition to the required biology course.

Note: A foreign language is encouraged by the department in meeting requirements of the core curriculum.



**D. ESTIMATED IMPACT**

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

**Little impact is anticipated to budget, facilities, or faculty workloads.**

**E. IMPACTS ON PROGRAMS/DEPTS:**

What programs/departments will be affected by this proposed action?  
Include information on the Programs/Departments contacted (e.g., email, memo)

**Students majoring in Biological Sciences will be impacted by these changes.**

**F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:**

Description of the student learning outcomes assessment process.)

Capstone projects in the Biological Sciences degree address the intended student learning outcomes of the Biological Sciences program, especially the “critical and creative thinking” outcome (<http://www.uaf.edu/provost/assessment-review/assessment/college-of-natural-science/>). All capstone projects are (and will continue to be) assessed using a common rubric (<http://www.bw.uaf.edu/undergraduates/capstone.php>). The new rules for satisfying the capstone requirement reflected in this program change will require the department chair to act as liaison between capstone course instructors and the Registrar in order to communicate a list of students who satisfactorily completed the capstone each semester.

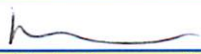
**JUSTIFICATION FOR ACTION REQUESTED**


The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

**Changes to the capstone project:** The majority of voting faculty of Biology and Wildlife Department favored decoupling the assessment of the capstone project from the assessment of the course in which it was completed, to ensure that the learning objectives of the capstone project are met for every graduating student.

**Changes to the minimum grade:** When the Faculty Senate decided in March 2013 to accept a C- as the minimum passing grade, the Biology & Wildlife faculty voted to retain the C as the minimum grade in our undergraduate programs. This was motivated by the desire to uphold standards. We were the only department in CNSM, and one of few departments at UAF, to retain the minimum C. Over the past year and a half, we have learned that misalignments with the rest of the university (and particularly the college) have placed our majors at a disadvantage. Although the majority of B&W faculty would still prefer C as the minimum grade, they acknowledge a greater need for alignment across departments. In a second vote in September 2014, the faculty agreed to accept C- as the minimum grade in our undergraduate degree programs.

**APPROVALS: SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE**

 Diane Wagner	Date	9/17/2014
Signature, Chair, Program/Department of:	Biology + Wildlife	

	Date	9-26-14
Signature, Chair, College/School Curriculum Council for:	CNSM	

	Date	9/26/14
Signature, Dean, College/School of:	CNSM	

**CHAIR SIGNATURE OBTAINED FOLLOWING APPROVAL BY FACULTY SENATE COMMITTEE**

	Date	
Signature, Chair, UAF Faculty Senate		
___ Curriculum Review Committee		
___ Graduate Academic and Advisory Committee		