UNIVERSITY of ALASKA SOUTHEAST

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Bachelor of Arts Biology
Bachelor of Science Biology
Bachelor of Science Marine Biology
Bachelor of Science Fisheries and Ocean Sciences with a Concentration in Fisheries Science
Annual Assessment Report for AY24
March 2025

Program Overview

The cluster of biology programs includes a B.S. degree in Biology, a B.A. degree in Biology, a B.S. degree in Marine Biology, a B.S. degree in Fisheries and Ocean Sciences with a Concentration in Fisheries Science that is jointly offered with UAF, pre-major programs for all of the above, a minor in Biology, a minor in Chemistry, and a concentration in Fisheries Science available to the first three of the aforementioned bachelor programs. The location of the University provides students with a "natural laboratory" that includes extensive marine habitat, rainforest, streams, lakes, wetlands, and ice fields all within walking or short driving distance of the classrooms. A small student-to-professor ratio ensures a more personal approach to learning than is possible at larger universities. Information about our degrees is found at http://www.uas.alaska.edu/artssciences/naturalsciences/biology/index.html.

The B.S. in Marine Biology was instituted in AY05 in support of the university's goal of being the premier in-state campus for marine science undergraduate programs. The B.A. in Biology was added in AY08 to provide a greater opportunity for students interested in a biology degree with a liberal arts focus. The B.A. degree is ideal for students with goals towards teaching in middle-school and secondary-schools and require a content degree in addition to broad training in liberal arts and sciences. The B.A. in Biology was derived from the B.S. in Biology program and no new courses were required to implement the program. The B.S. degree in Fisheries and Ocean Sciences and the Concentration in Fisheries commenced in AY18. The Chemistry minor was added more recently.

B.S. Degree – Biology: The Bachelor of Science degree in Biology provides students the opportunity to learn biological principles and skills in lecture, laboratory, and field courses. Student research is emphasized throughout the program. Program faculty are actively involved in a wide range of disciplines, including biological and fisheries oceanography, marine ecology, behavioral ecology, evolution, marine mammalogy, invertebrate physiology, and pollution biology. The Bachelor of Science program in biology comprises a core curriculum generally found nationwide in Bachelor of Science biology programs.

B.S. Degree – Marine Biology: The B.S. degree in Marine Biology provides students with the opportunity to learn biological principles and skills in lecture, laboratory and field courses with a core curriculum in marine biology. Student research is emphasized throughout the program.

The program has faculty actively involved in a wide range of disciplines described above. The Marine Biology B.S is enhanced by the onsite flow-through seawater system located on the main campus, and intertidal field sites for students directly behind the teaching lab. There are few campuses that can boast of the connection between a marine laboratory and the main campus!

B.S. Degree – Fisheries and Ocean Science with a Concentration in Fisheries:
The UAS-UAF Joint B.S. degree in Fisheries and Ocean Sciences with a concentration in Fisheries Sciences (Fisheries B.S.) provides students with the opportunity to learn fisheries and ocean sciences and skills in lecture, laboratory and field courses with a core curriculum in fisheries science across the two campuses. Student internships in fisheries industries and fisheries science research is emphasized throughout the program. Students enjoy designing their upper-division elective coursework from many options offered through UAS Natural Sciences and UAF College of Fisheries and Ocean Sciences. The program has faculty actively involved in a wide range of disciplines described above. Like the B.S. Marine Biology, onsite teaching and research resources on campus enhance the Fisheries B.S.

B.A. Degree – Biology: The B.A. degree in Biology provides students with the opportunity to learn biological principles and skills in lecture, laboratory and field courses with a breadth in liberal arts and sciences.

Biology Minor: This minor is designed to provide students with a broad introduction to the discipline of biology as well as the opportunity for advanced study in three focus areas.

Chemistry Minor: This minor is designed to provide students with a broad introduction to the discipline of chemistry as well as the opportunity for advanced study in specific focus areas.

Fisheries Science Concentration: This concentration is designed for students in one of the cluster of biology programs to gain a broad introduction to the biology, assessment, and management of fish populations harvested for human consumption, in preparation for a career in the fisheries of Alaska and elsewhere.

Program Student Learning Outcomes
The following program student learning outcomes (PSLOs) are based on our Program Assessment Plan finalized in fall 2017. The PSLOs are common to all four degree programs. Note, we modified our PSLOs in AY25 following feedback from the Dean and others. However, the data collected for AY 24 were collected under the PSLOs finalized in 2017. Consequently, this report describes and analyzes how those older PSLOs were met. Note also that some data for some classes used in the PSLOs are missing because a faculty member retired at the end of FY 24 and these data were not obtained prior to her retirement. Currently, we are collecting data for our AY 25 report that will inform our assessment of the PSLOs approved in AY 25.

Program Student Learning Outcomes (PSLOs)
1) Students will gain a broad background in biological sciences.
2) Students will develop critical thinking skills.

3) Students will improve oral and written scientific communication skills.
4) Students will gain practical experiences in basic biological research.

Method of Data Collection on Program SLOs.

PSLO 1: Broad Background in Biological Sciences: Students will demonstrate a broad knowledge of biology including chemical principles, cellular metabolisms, organismal diversity, principles of genetics and evolution

1.1) We report on the percentage of students who passed (earned a C or better) the first (BIOL 115) and second (BIOL 116) semester of the Fundamentals of Biology two course series. We compare this across years.

1.2) We examine the distribution of grades in one lower-division required course (BIOL S271) and one upper-division required course (BIOL S362) to determine the percentage of students who pass with a C or better. We compare this across years.

PSLO 2: Develop Critical Thinking Skills. Students will demonstrate that they can use an empirical approach to evaluate a biological phenomenon using the primary literature.

2.1) We assess the percentage of students in a lower division course (BIOL S271) who receive a C, B, or A on their written research report. We compare these data to those obtained from two upper division courses (BIOL S362 and BIOL S384).

2.2) We assess the proportion of students earning a C or better for the portion of the grade based on the primary literature (e.g., discussion grade, written research paper) in one lower-division course (BIOL S110) and two upper-division courses (BIOL S311, S380).

2.3) We assess the percentage of students in a lower division course (BIOL S271) who earn a C, B, or A on their written report that requires them to use the scientific method to solve scientific problems in the field and lab. We compare these data to those obtained from an upper division course (BIOL S362).

PSLO 3: Oral & Written Scientific Communication Skills. Students will demonstrate that they are able to represent and communicate biological information.

3.1) We assess the percentage of students in a lower division course (BIOL S215) who receive a C, B, or A on their oral presentation. We compare these data to that obtained from an upper division course (BIOL S384).

3.2) We assess the percentage of students in a lower division course (BIOL S115) who earn a C, B, or A on their written research paper. We compare these data to that obtained from an upper division course (BIOL S380).

3.3) We assess the percentage of students in a lower division course (CHEM S105) who earn a C, B, or A on their written lab notebook. We compare these data to that obtained from an upper division course (CHEM S341).

PSLO 4: Students will gain practical experiences in basic biological research. Students will demonstrate their knowledge of techniques and skills gained in the biological sciences.

4.1) We assess the percentage of students who receive a C, B, or A on the laboratory practical in a lower division course (BIOL 116) and an upper-division course (CHEM 342).

Data Collected on Program Student Learning Outcomes for AY24. The following program student learning outcomes data summary table is based on our Program Assessment Plan that was finalized in Fall 2017, and includes data for AY24 only. Note: we have changed our PSLOs for AY 25 and also our data collection methods, but do not have AY 24 to inform the PSLOs adopted in AY 25. Some data are missing for this AY24 assessment (NA) due to retirement of a CHEM faculty who could not be reached to obtain necessary data. Two courses were not offered in AY24 (BIOL 110, BIOL 384), so data could not be obtained from them.

PSLO	Course	Metric	%
1.1	BIOL S115	% students earning a C or better	70
1.1	BIOL S116	% students earning a C or better	88
1.2	BIOL S271	% students earning a C or better	100
1.2	BIOL 310	% students earning a C or better	93
1.2	BIOL S362	% of students earning a C or better	NA
2.1	BIOL S271	% students earning a C or better on their written research paper	100
2.1	BIOL S362	% students earning a C or better on their written research paper	NA
2.2	BIOL S110	% of students earning a C or better for the portion of the grade based on the primary literature (discussion grade)	NA
2.2	BIOL S375	% of students earning a C or better for the portion of the grade based on the primary literature (discussion grade)	100
2.2	BIOL S405	% of students earning a C or better for the portion of the grade based on the primary literature (written research paper)	88
2.3	BIOL S115	% of students earning a C or better on their written report that requires them to use the scientific method to solve scientific problems in the field and lab	83
2.3	BIOL S427	% of students earning a C or better on their written report that requires them to use the scientific method to solve scientific problems in the field and lab	80
3.1	BIOL S215	% of students earning a C or better on their oral presentation	86
3.1	BIOL S384	% of students earning a C or better on their oral presentation	NA
3.1	BIOL S427	% of students earning a C or better on their oral presentation	100
3.2	BIOL S110	% students earning a C or better on their written research paper	NA
3.2	BIOL S384	% students earning a C or better on their written research report	NA

3.3	CHEM S106	% of students earning a C or better on their written lab notebook	NA
3.3	CHEM S321	% of students earning a C or better on their written lab notebook	NA
4.1	BIOL S116	% of students earning a C or better on the laboratory practical	84
4.1	CHEM S321	% of students earning a C or better on the laboratory practical	NA

Evaluation of the Data Collected on PSLOs for AY24

On average, 89% of students achieved the PSLOs for the Biology, Marine Biology, and Fisheries program PSLOs that could be quantified using our scoring system above. This is consistent with the last 5-year period (88%) and indicates that our program is generally effective at meeting the PSLO's outlined in this plan. There was strong improvement in achieving PSLO 1 between the first (BIOL S115, 70%) and second (BIOL S116, 88%) second semester introductory biology course. Students showed strong written expression of critical thinking skills (PSLO 2) in the lower-division course (BIOL S271, 100%) for which we have data this year. Students demonstrated solid oral presentation skills (PSLO 3), with improvement from lower (BIOL 215) to upper division courses (BIOL 427). Students were somewhat weaker on written lab reports that require use of critical thinking (PSLO 2: BIOL 115, BIOL 427). This is a long-term pattern of weaker writing than oral expression in our students, and suggests we should continue to provide opportunities for students to improve expressing themselves and their thinking in written form. We have no data for written lab notebooks in lower-division and upper division courses (PSLO 3.2, 3.3) because the faculty member with access to these data retired in Spring 2024 before we could obtain these data. Finally, we note that the present PSLO assessment does not include BIOL S498, where upper-division students gain most of their practical skills through research projects. This will be addressed in future program assessments with the new PSLOs we will use for our AY 25 assessment. Overall, we are encouraged by the achievement of PSLOs by our students, but see areas where we can improve program delivery and assessment.

Tutoring

In past years we have often had tutoring from term faculty. This year we did not, but there is tutoring available through the NRSC to whom we can refer students. It would be helpful in the future to increase tutoring opportunities for students to make that an integrated part of the learning culture at UAS.

New Program Additions

We have entirely new faculty members in Chemistry, so it is a period of turnover in teaching styles and course offerings. We have seen a great deal of recent interest among students in getting a Chemistry minor and anticipate that will continue in future years.

Student Exit Interviews

We typically distribute exit interviews to our graduating seniors each spring. However, exit interview questions were not requested of students in Spring 2024. Wes will make use of the

service workload capacity of term Assistant Professor Jason Kuhn to re-invigorate our exit interviews in Spring 2025 and use the results to inform our assessment of PSLOs in AY25.

Plans to Improve Future Student Learning

Faculty have discussed ways to improve student learning. One of the more successful strategies for this has been use of curriculum development and academic innovation funds to increase the proportion of active learning and locally based lab activities in our courses. These funds have come from within UAS and from INBRE. We will continue to apply for such funds. Faculty are also actively trying to use less expensive course resources (Open textbooks) to make them more accessible to students.

Moving forward, we will use our revised PSLOs for all four degree programs. By the time students have completed their degree, students will be able to:

1) Describe the fundamental levels of biological organization and their interrelationships.
2) Collect and quantitatively analyze biological data.
3) Communicate biological concepts, principles, and research to other scientists and the public in written and verbal form.
4) Integrate biological concepts with broader societal issues and solutions.
5) Develop laboratory and field skills through practical experiences rooted in the biological sciences.

We are in the processes of assessing the new PSLO 1 above using data from student course evaluations and exit interviews in AY25. These results will help us improve student learning moving forward. It is clear from the present assessment that we will also need to work on new PSLO 3, specifically with respect to written communication.