

Chemistry - Bachelor of Science - Mid-Cycle Review & SLOA Year

Current Compliance Year: 2022-2023

Mid-Cycle review

Recent Recommendations

Feedback will include recommendations from the last Expedited Review or from your most recent review by your school or college. You may not see any feedback or recommendations until you have completed your first full or mid-cycle review.

Response to Previous Recommendations (if any):

We did not receive recommendations following the 2019-2020 Program Review.
--

Student Learning Outcomes

The previous Student Learning Outcomes Assessment has been submitted as its own report. Going forward you will use the following prompts to discuss the success of your most recent SLOA plan and address your assessment activities since your last SLOA report (typically the past two years or since your last program review).

Learning outcomes feedback from last review:

Feedback will be provided once you have completed a full or mid-cycle review.

Discuss your SLOA findings, changes you are making and what you hope to see as a result:

- | |
|---|
| <ul style="list-style-type: none">a. General Chemistry 2nd Semester Exam: Students in general performed at or above the national norm for this exam with one student scoring in the 97th percentile. Diagnostic Undergraduate Chemistry Knowledge (DUCK) Exam: Three students took the DUCK exam in Fall 2021 and five in Fall 2022. Students in 2021 averaged in the 57th percentile with the low being 42nd and the high being in the 87th percentile. In 2022 two students scored very high and 3 scored low. The average percentile was 48th, the low was in the 14th, and the high was in 99th. Overall, students' performance aligned with national norms.b. Students enrolled in our Seminar sequence (CHEM 481 & CHEM 482) received peer and instructor evaluations in written form.c. CHEM 488 Undergraduate Research students presented posters and were formally peer and faculty reviewed.d. Written reports of CHEM 488 presentations were collected and archived for ACS accreditation needs.e. Seven students presented posters in 2021 and nine in 2022. Students presented their posters virtually in 2021 and in person in 2022. One of our students won 2nd place at INBRE's 2022 IDeA Research Retreat.f. Student research proposals to URSA, BLaST, and INBRE are highly encouraged and success rates are examined. |
|---|

Discuss the curricular changes made based on assessing your SLO. If you haven't made any curricular changes, please explain why not and address what you did notice in the review, including strengths of your curriculum through the assessment of your outcomes:

Some planning for strategic enrollment has begun to develop a new micro-credential program. The program will focus on using and troubleshooting commonly used analytical instruments and should increase enrollment by targeting employers, employees, and students.

Seminars continue to need enhancement from outside speakers in industry. Faculty is actively working on finding creative ways to enhance the course despite budget restraint such as reaching out to past colleagues and recent graduates.

We do not have the faculty to teach a General Chemistry Honors Laboratory course due to key faculty leaving or retiring. The honors lab is no longer offered until we have the faculty to reinstate it.

Are communication outcomes embedded in the SLOA Plan?

As of 2017 all Baccalaureate programs were required to embed the communication outcomes within their SLOA Plans, this is optional for non-Baccalaureate programs.

Embedded

Student Success

To access the Student Success Dashboard please sign into a UA computer with VPN connection (if not on campus). You will need your UA credentials and it is best accessed with the most updated version of Chrome, Edge, Firefox or Safari browsers; Internet Explorer is not supported. You will need to filter the data to see your programs. If you need assistance in finding the data for your programs, please contact your data liaison or [Julia Manfredini](#) in the PAIR office.

Data Liaisons

Each school or college has a team of Data Liaisons to help you analyze the data provided in the portal and may be able to help you see your data in multiple contexts. You can find a list of data liaisons on the resources page for Program Review.

The college or school level committee will also have access to this data with the goal that by providing these visualizations data availability will be increased.

Data supplied within the dashboard linked below is intended for Academic Program Review and not for any other purpose.

[Student Success Data Dashboard](#)

Previous Feedback

Feedback will be provided once you have completed a full or mid-cycle review.

Student Success Data Trends:

Decline in degrees awarded, Decrease in pass rates, Equity gaps, Increase in persistence, Decline in majors

If equity gaps were found in any of your disaggregated student success data, please explain how you plan to address those gaps. Please contact your data liaison or make an appointment with [Julia Manfredini](#) to learn more about analyzing your data.

We have seen a steady increase in both [REDACTED] (11.7% in 2022) and [REDACTED] (14.3% in 2022) students but should continue to work towards increasing enrollment in these groups. We could potentially attribute the increase of [REDACTED] students to faculty working with RAHI, ANSEP, and the rural college whose primary focus within these groups is [REDACTED] outreach and increasing interest in the sciences. Additionally, our [REDACTED] students account for a smaller percentage (2.6%) of the overall student body. We can work to continue addressing equity gaps by fostering a more inclusive culture, encouraging our students to push through equity barriers, and finding and participating in outreach programs that seek to serve [REDACTED] and [REDACTED] students.

Optional Data Explanation

Feel free to share more of your thoughts on the data provided.

High Impact Practices

According to the AAC&U, High-Impact Educational Practices “have been widely tested and have been shown to be beneficial to college students from many backgrounds.” UAF is particularly interested in Undergraduate Research and/or Scholarly Activity because it is one of our mission fulfillment indicators, but all of these researched High-Impact Educational Practices should be reflected in your program’s student learning outcomes and curriculum.

Previous Feedback

Feedback will be provided once you have completed a full or mid-cycle review.

High-Impact Practices Used in this Program

Please use the following fields to discuss how your program is using the high-impact practices, successes and known issues and solutions, or ways you are considering incorporating them in the future. If you are not using any of the high-impact practices listed, please use the “Other or None of These,” field to share what your program is doing to help students be successful.

High Impact Practices that currently apply to your program:

Collaborative Assignments and Projects, Undergraduate Research, Capstone Courses and Projects

Other or None of these (explain)

Submission

Submitter & Collaborator Names

Brian Rasley, Tom Green, Larry Duffy

Submitter Email

btrasley@alaska.edu

College or School Review Committee

The college or school committees set the tone for helping each program feel seen during this process. We have provided you with strength-based feedback tags to attach to this program review. Please select as many as applicable.

Overall Recommendations

--

Explanation of Recommendations

--

Student Learning Outcomes Assessment Feedback (tags)

Missing curricular connection,Missing a direct measure
--

Student Learning Outcomes Assessment Feedback (narrative)

While the program has clearly given thought to the plan and report, there is some confusion between outcome, instrument, and assessment. For example, “Graduates will have hands-on experience” is a statement of what will be done in class rather than the learning outcome. The program meaningfully addresses the curricular changes made based on strategic enrollment, course enhancement, and faculty shortage.
--

Profile Feedback

--

Financial Feedback

--

Student Success & Equity Feedback

It would be helpful to see some discussion of the tags that you have chosen. While the program focuses on race equity gaps in enrollment and discusses possible steps for improvement, it would be meaningful to identify some other equity gaps and include discussion of overall student success such as enrollment and degrees awarded.
--

High-Impact Practices Feedback

The committee appreciates the way that the program has integrated high impact practices into the curriculum, and the way that they were described in the report.
--

UNIVERSITY OF ALASKA FAIRBANKS
Student Learning Outcomes Assessment Plan
Chemistry & Biochemistry B.S Program
 College of Natural Sciences and Mathematics
 May 2018

MISSION STATEMENT:

The Department of Chemistry and Biochemistry seeks to educate all levels of students in chemical principles, practice, and safety and to attract students to further study in Chemistry and Biochemistry. We educate majors broadly through study of Organic, Inorganic, Physical, Analytical, and Biochemistry in accordance with the guidelines of the American Chemical Society Committee on Professional Training and provide concentrations in Biochemistry and Molecular Biology, Environmental Chemistry, and Forensic Chemistry.

GOAL STATEMENT:

To prepare undergraduate students for careers in Chemistry, Biochemistry, or Chemistry-related occupations or for further study in graduate or professional schools.

Intended Objectives/Outcomes	Assessment Criteria and Procedures	Implementation (what, when, who)
1. Introductory courses provide fundamental chemical knowledge consistent with national standards for chemistry competency.	Instrument: American Chemical Society Standardized Exams in General Chemistry and Organic Chemistry. Instrument: Nationally-recognized curriculum resources, both written and online, will be utilized and consistently used across the General Chemistry curriculum.	Instructors will assess chemical knowledge of students in General Chemistry and Organic Chemistry courses by administering the ACS Exams. Student performance will be assessed by instructors and department chair annually with respect to subject knowledge. Results will be shared with Faculty and plans will be developed to address deficiencies. General Chemistry faculty will meet annually to discuss textbooks, online resources and effectiveness.
2. BS Graduates attain baccalaureate level chemistry knowledge in accordance with American Chemical Society Guidelines.	Instrument: American Chemical Society Diagnostic of Undergraduate Chemical Knowledge (DUCK), a senior level exam.	Instructor of Capstone Chemistry Course (Chem F434) will assess chemical knowledge of graduating seniors by administering the ACS DUCK Exam. Student performance will be assessed by instructor and annually with respect to subject knowledge. Results will be shared with Faculty and plans will be developed to address deficiencies.

3a. Graduates will have problem solving, laboratory, and safety skills. 3b. Graduates will have hands-on experience with modern chemical instrumentation.	3a. Instrument: All laboratories throughout the curriculum will convey modern safety protocols to the students at the start of each semester. Instrument: Undergraduates research students in Chem F488 will meet with the Safety Officer in the department. Instrument: Undergraduate research students are required to take at 3-6 credit hours of undergraduate research Chem F488 as part of the BS Chemistry major. 3b. Instrument: All laboratory courses will incorporate hands-on use of modern instrumentation, including Chem F314 Instrumental Analysis, Chem F321,325 Organic Chemistry, Chem F331,332, Physical Chemistry, and Chem F434, Capstone Chemistry.	All teaching assistants will be provided safety training by faculty and/or staff prior to teaching the laboratory. Research students will write standard operating procedures (SOPs) for research and discuss with the Safety Officer. The Safety Officer and faculty will provide additional safety training when required. Faculty will review research posters and reports annually to assess quality. Posters and reports are archived for use in American Chemical Society accreditation (five-year cycle). The ACS Duck exam tests student knowledge in instrumental techniques, including all commonly employed spectroscopic and chromatographic techniques. Results will be evaluated annually.
4. Communication skills. 4a. Oral: Student effectively communicate their work through oral/audiovisual presentations. 4b. Written: Student writing skills are consistent with professional standards.	4a. Oral Instrument: Oral presentation of posters is required for all Chem F488 research students. Oral Instrument: All undergraduate chemistry majors are required to take 3 credit hours of Seminar Chem F481 and F482. 4b. Writing Instrument: Written reports in journal format are required for all Chem F488 research students. Writing Instrument: Senior Capstone students (Chem F434) are required to write reports in either journal format or as a technical report.	Faculty will review oral presentations of posters at end-of-semester event. Copies of oral posters will be archived. Students presentations of seminars will be formally peer- and faculty-reviewed using a standard evaluation form. Students will be required to review external seminars by professional chemists and biochemists. Written Chem F488 reports will be evaluated by assigned faculty mentors. Reports will be archived for future accreditation.

4. Communications Skills (cont'd)	Writing Instrument: Students are encouraged to write research proposals with guidance of their mentor.	Students are encouraged to submit written internal proposals to URSA, BLAST and INBRE. Overall funding rates will be used to assess overall writing competitiveness.
5. Graduates are employed or continue education following graduation.	Graduates will be surveyed upon graduation using anonymous online forms.	Surveys will be evaluated with respect to acceptances into professional schools and employment. Students will provide answers to online questions about overall preparedness for further study or employment.