Chemistry ACS- ALL

Program-225

Annual Assessment Plan

1

2 **PLO 01 - Fundamental**

Describe the fundamental principles and applications of chemistry

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 1 - Foundations for Learning

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 105: ACS Gen. Chem. 1st term Exam (percentile score)	80% will be Proficient-- Below Basic: 0-25; Basic: 25-50; Proficient: 50-75; Advanced/Exemplary: 75-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

86% for Fall, and 100% for Spring - Yes, our majors met this criteria.

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

3 **PLO 02 - Matter**

Describe the structure and composition of matter

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 2 - Breadth and Depth of Knowledge

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 105: 3rd exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

Measures	Targets	Timeline
CHEM 309: 1st exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 361: ACS Final (percentile score)	80% will be Proficient-- Below Basic: 0-40; Basic: 40-60; Proficient: 60-80; Advanced/Exemplary: 80-100	Each course offering
CHEM 410: Sections of the 1st, 2nd, and 3rd exams	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 438: Exam on the topic of Atomic Structure (typically Exam II)	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

57% for CHEM 105 in the fall
73% for CHEM 310
63% for CHEM 410
26% for CHEM 361 (different score than provided by AEFIS link; we counted the students "by hand")

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

Our program is rigorous, and we have set the standards for proficient at a B level. On any given measure, there are students who don't meet this criteria, especially in first year courses where students often find their high school preparation, and strategies for doing college level work, are not adequate. The score that concerns us is in CHEM 361 - an advanced major's course. We are using an ACS exam that likely tests knowledge after a two-semester sequence of inorganic chemistry. We are unable to offer two courses here, and thus students do not get to the more advanced topics that are on this exam. We plan to purchase a look at a brand new 1 semester "sophomore" level inorganic ACS exam, and possibly use it going forward. However, we don't teach this course, next year, so we won't have different results next year.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

4 **PLO 03 - Reaction types**

Describe the major reaction types in chemistry

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline

Measures	Targets	Timeline
CHEM 105: 2nd exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 309: ACS First Term Organic Chemistry Exam (percentile score)	80% will be Proficient-- Below Basic: 0-25; Basic: 25-50; Proficient: 50-75; Advanced/Exemplary: 75-100	Each course offering
CHEM 310: ACS Organic Chemistry Exam (percentile score)	80% will be Proficient-- Below Basic: 0-25; Basic: 25-50; Proficient: 50-75; Advanced/Exemplary: 75-100	Each course offering
CHEM 361: 3rd Exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

57% in CHEM 105 Fall, 100% in CHEM 105 Spring
67% in CHEM 309
78% for ALL students in CHEM 310 (tabulated manually, AEFIS is not linking one of the section's data; we've tried relinking multiple times)
63% for CHEM 361

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

Again, the results in a freshman, fall, course reflect the reality of our student's ability. The spring rate is high, but that was only for one major in that section. We are very pleased with the results in 309 and 310; an average exam score at the 78th

percentile, compared to nation-wide data, on a comprehensive year-long final, is very good!

Our primary action plan for next year is to revisit the first year chemistry placement process, with a heavier focus on math skills. We will administer our own short math exercise on the first day of class, and hope, in the long term, to map performance on it to overall grades, and performance on ACS finals, as well as participation in a variety of student support offerings.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

5 **PLO 04 - Laws and principles**

Apply the laws and principles of equilibrium, thermodynamics, and kinetics to chemical systems

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 2 - Breadth and Depth of Knowledge

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline

Measures	Targets	Timeline
CHEM 106: ACS Gen. Chem. 2nd term Exam (percentile score)	80% will be Proficient-- Below Basic: 0-25; Basic: 25-50; Proficient: 50-75; Advanced/Exemplary: 75-100	Each course offering
CHEM 221: 2nd exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 437: Exam average, excluding the ACS exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 321: 1st Exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 410: Sections of the 2nd exam	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80;	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

75% in CHEM 106
50% in CHEM 221
83% in CHEM 437
63% in CHEM 410
No action plans here. These are the percentages of students who earned a B or higher on these assessments.

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

6 **PLO 05 - Mathematical tools**

Apply mathematical tools to the study of chemical systems

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 106: Exam 1	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 221: Exam 1	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

Measures	Targets	Timeline
CHEM 437: ACS Exam: Physical Chemistry - thermodynamics (percentile score)	80% will be Proficient-- Below Basic: 0-40; Basic: 40-60; Proficient: 60-80; Advanced/Exemplary: 80-100	Each course offering
CHEM 321: ACS Final (percentile score)	80% will be Proficient-- Below Basic: 0-40; Basic: 40-60; Proficient: 60-80; Advanced/Exemplary: 80-100	Each course offering
CHEM 438: ACS Exam Physical Chemistry: Quantum	80% will be Proficient-- Below Basic: 0-40; Basic: 40-60;	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

63% in CHEM 106
75% in CHEM 221
100% in CHEM 437
No action plans here. Very strong performance in the physical chemistry standardized exam this term!

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

7 **PLO 06 - Chemical processes**

Describe the chemical processes that enable living systems to function

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 2 - Breadth and Depth of Knowledge

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 412	80% will score 80% or higher	each offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

> 100% of majors scored at the 80th percentile or higher, on this ACS final. The overall class mean - all students - not just our majors - was at the 95th percentile this year!

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

8 **PLO 07 - Safely**

Work effectively and safely in the laboratory

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 2 - Breadth and Depth of Knowledge

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 106: Safety exercise for a specific mid-semester laboratory	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 309: some lab about in the middle of the term	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

Measures	Targets	Timeline
CHEM 390: ACS safety exam (percentile scores)	80% will be Proficient-- Below Basic: 0-40; Basic: 40-60; Proficient: 60-80; Advanced/Exemplary: 80-100	Each course offering
CHEM 342: Discussion	80% will be Proficient-- Below	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

100% in CHEM 106
Data not available for CHEM 309, although it looks linked from Canvas
100% in CHEM 390
100% in CHEM 342

Safety is well taught in our curriculum.

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

9 **PLO 08 - Central techniques**

Apply central techniques for characterizing chemical compounds and mixtures

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 2 - Breadth and Depth of Knowledge

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 106: Two-week, qualitative analysis laboratory score	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 221: Course lab grade	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 321: Lab grade or last project score	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 342: Lab Report/Problem Set	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

Measures	Targets	Timeline
CHEM 361: Lab grade	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 310: Lab Final	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 410: Final lab report	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

> 100% in CHEM 106, CHEM 221, CHEM 342, CHEM 361 and CHEM 410. These lab skills are adequately covered.

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

10 **PLO 09 - Faith**

Integrate personal Christian faith to the discipline of chemistry or biochemistry

Outcome(s)

1. Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2. Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 3 - Faith Knowledge & Application

3. **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 495: Science-Faith paper	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4. **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

Cannot access this - the course is cross-listed CHEM and BIOL 495, and while we can see some links in Canvas, we don't have data in AEFIS. Next year this course will come under a uniform SCIE prefix - and we hope the mapping can be completed.

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

Next year, both biology and chemistry need our outcomes in this area mapped to the "new" SCIE 495 course.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

11 **PLO 10 - Lab reports**

Compose abstracts, written lab reports or research summaries according to standards of the American Chemical Society

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 4 - Specialized Skills and Scholarship

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 321: Formal lab report grade	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 342: Assignment Rubric	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 221: Formal laboratory report score	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

83% in CHEM 221
67% in CHEM 342

Lower scores in 342 reflect the abilities of a couple students in the course; both of whom are B/C students in chemistry; but both who had accepted industrial laboratory jobs before graduation!

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

12 **PLO 11 - Scientific literature**

Obtain, organize, and present information from the primary scientific literature

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 4 - Specialized Skills and Scholarship

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 342: Presentation	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 221: Methods Paper/presentation	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

> 83% in CHEM 221
> 100% in CHEM 342
> (Don't know why CHEM 412 isn't listed in AEFIS; it is linked in Canvas.)

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

13 **PLO 12 - Research project**

Formulate a research question, undertake a project designed to answer the question, and present the work orally or with a scientific poster

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 393: Final proposal	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering
CHEM 422: Final course grade	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

100% for BIOL 393 all majors. Can't seem to pull our students out of this. They have been officially in the BIOL 393 Canvas course this year, because it has been taught by biologists all year.

Can't link AEFIS to a final course grade. CHEM 422 is not set up yet for this analysis.

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

The departments of Biological Sciences, and Chemistry and Biochemistry, plan to include specific 15 point assessments in Canvas for the paper, presentation and poster that these students most complete. Then we should be able to get some data in this area that is real. It is, however, still a cross-listed course, and we are unsure if AEFIS is able to work with that yet.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

14 **PLO 13 - Careers**

Identify careers in chemistry that connect with one's vocational call

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 5 - Self-Awareness

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 390: Career assignment (personal statement, cover letter, and resume)	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4

Results - Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

> 100% for CHEM 390

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

15 **PLO 14 - Respond ethically**

Analyze and respond ethically to case studies that demonstrate common moral dilemmas in the chemical or biochemical workplace

Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

Selected Outcomes:

- ULO 6 - Social Responsibility

3 **Please Enter The Following Information Below:**

Measures - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

Timeline - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
CHEM 490: Discussion leading grade	80% will be Proficient-- Below Basic: 0-70; Basic: 70-80; Proficient: 80-90; Advanced/Exemplary: 90-100	Each course offering

4 **Results -** Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. *Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

100% for CHEM 490

5 **Action Plans** - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

6 **Closing the Loop** - If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

2 Holistic program improvement goals: Programs are expected to have at least one action plan to improve student learning annually. If you have not yet identified an action plan associated with this year's assessment results, or if the department has identified additional issues that require action plans, describe the specific, measurable action plan and its relation to evidence of student performance.

We plan to rework our first year placement process. We will still provide and request that students complete the summer ALEKS review course. We plan to cancel the Monday morning (of welcome weekend) Toledo exam, and instead give a 15 minute math assessment on the first day of class. We are following a process, and using an exam, found in the chemical education literature. This math

assessment will be used as a placement measure for students not completing the summer work, and will also stand as an additional piece of readiness evidence for those who have completed the process, but have likely needed between 2 to 4 times more hours than mean time needed by the students.

Assessment Rubric

1

Process

	1	2	3	4
Is the plan being implemented faithfully and revised as needed?	○ Assessment plan is not implemented.	○ Most aspects of plan are being implemented or all aspects are implemented to some degree.	○ Assessment plan is fully implemented.	◉ Plan is faithfully executed and modified/evaluated as needed.

2 Explanations:

3

Engagement

	1	2	3	4

	1	2	3	4
Are all relevant parties are meaningfully involved in the creation/revision, implementation, analysis, interpretation and learning improvement process?	○ Limited involvement beyond chair/director	○ All educators contributing to the curriculum are aware of process and results	◉ All educators contributing to the curriculum participate in conversations regarding the use of assessment data to improve student learning	○ All relevant stakeholders (students, employers, alumni) are meaningfully involved in the creation/revision, implementation, analysis, interpretation, and/or improvement processes associated with this assessment plan.

4 Explanations:

No bandwidth to invite alumni to come and help us write and revise an assessment plan. We don't even know the employers of our students, so this is an unrealistic expectation.

5

Program Learning Objectives

	1	2	3	4

	1	2	3	4
Are the program learning objectives clear, measurable, aligned with ULOs/GLOs, and representative of the range of learning for that major/program?	○ PLOs are problematic (vague, abstract, not aligned with ULOs/GLOs) or missing.	○ PLOs are clear, mostly measurable, partially aligned with ULOs/GLOs.	○ PLOs are clear, measureable, aligned with ULOs/GLOs, and represent a summary of the knowledge, skills, beliefs, and values that a graduate of this major/program should attain by completing the required curriculum, accounting for variations in learning outcomes due to tracks/concentrations	◉ PLOs are clear, measurable, aligned with ULOs/GLOs, and representative of the range of learning students achieve through completion of the program. The learning objectives provide a comprehensive view of the knowledge, skills, beliefs, and values that are important for a graduate of this major/program and account for variations in learning outcomes due to tracks/concentrations.

6 Explanations:

7

Measures

	1	2	3	4

	1	2	3	4
Are the instruments used to assess learning relevant to the objective? Do measures yield information/data you can use to drive improvement?	Not all objectives have a measure identified. OR Measures do not directly connect to the objectives.	All objectives have at least one direct measure. Measures connect to learning objectives superficially or tangentially and/or include learning other than stated objectives. Relies almost exclusively on the same form of assessment (survey, exam, project). Relies almost exclusively on data from a single source (course, program, activity).	All objectives have at least one direct measure. Some objectives have multiple measures. Measures clearly connect to learning objectives. And two of the following four criteria: Objective measures more than one point in time (formative). Indirect measure are used strategically. Plan Incorporates different forms of assessment (survey, exam, project). Plan incorporates from a variety of sources (course, program, activity).	Measures meet all of the following criteria: All objectives have at least one direct measure. Some objectives have multiple measures. Measures clearly connect to learning objectives. Objectives measured more than one point in time (formative). Indirect measures are used strategically. Plan incorporates different forms of assessment (survey, exam, project). Plan incorporates data from a variety of sources (course, program, activity).

8 Explanations:

9

Targets

	1	2	3	4

	1	2	3	4
Are the targets based on professional standards and/or analysis of past student work? Are targets challenging and achievable?	Some targets are missing.	Targets are arbitrarily chosen or reflect minimal expectations.	Targets are challenging and achievable based on prior student performance, and reflect an appropriate level of performance.	Targets are challenging and achievable. Targets are based on professional standards and/or prior student performance. Targets are set at a level to inspire program improvement.

10 Explanations:

Our program has a long history of all of graduates getting jobs or heading to the graduate school or professional school of their choice, and ultimately finding fulfilling careers, in health, science and education, regardless of their being A, or C students. With national standardized exams at our disposal for all courses, we can see when we are teaching courses at the right level. Thus, our numerical targets are challenging. We don't necessarily believe that 80% of our students will get a "B" on each assessment measure, but neither do we want to lower our standards just to get numbers and charts that look better.

From the dean: I'll talk with Rick about this in the fall, to ensure that I'm understanding the meaning of each of the targets and their mathematical interpretation. In some cases it seems that a target is set high ('80%'), the data indicates the target isn't met or close to met ('78% or 67%') and the dept conclusion is that they are very pleased with the result (because 67% is commendable on a national scale for this measure and 78% is impressive). If the dept is so pleased that they feel no action is necessary, why such a high target? It doesn't seem to be 'aspirational' if the dept doesn't feel the need to take action toward greater achievement. I'm concerned that I may not be interpreting the results correctly (easy to do with percentages).

11

Timeline

	1	2	3	4
Is the timeline for data collection manageable with sufficient data points to effectively inform decision making and program review?	Not identified clearly for all measures.	Clearly states semester/year for each objective/measure. Data analysis delayed from data collection. Time between collection points may not facilitate informed decision making.	Clearly stated and manageable schedule. At least two data points for each objective per review cycle.	Timeline for data collection is manageable and allows for continuous improvement with timely and meaningful decision making even before program review.

12 Explanations:

The department uses a focused departmental meeting each semester to make AEFIS links, and look for problems in the AEFIS mapping itself. The missed mapping and links, in AEFIS, is time-consuming to resolve. We have yet to get through a semester where all the links have accurately been made.

13

Action Plan

	1	2	3	4

	1	2	3	4
Is the department effectively examining and using assessment data to revise curriculum and pedagogy to support student learning?	Assessment data not collected/analyzed/used for decisions and/or results not documented in AEFIS.	Data collected, documented and discussed by department. Department reviewed confidence in measures and data as sufficient indicators of student performance. If data indicated changes were needed, action plans were developed in consultation with dean (e.g. improving outcomes, measures, targets, curriculum or pedagogy).	Data collected, documented and discussed by department. Department and dean confirmed confidence in measures and data as sufficient indicators of student performance. Action plans (e.g. improving outcomes, measures, targets, curriculum or pedagogy) developed in consultation with dean. If prior year data warranted action plans, the department implemented the changes.	Department collected and discussed follow-up data after the implementation of action plans in order to determine whether changes resulted in improvement or whether additional action is necessary. Data confirms effective curriculum and pedagogy for learning outcomes. Score of 4 should be assigned only if objectives, measures, targets and timeline all score a 4.

14 Explanations:

We look at this data at every spring faculty development week, departmental meeting. However, we get a much better sense of where improvements need to be made by just teaching our courses, and working with students, on a daily basis.

15

Dissemination

	1	2	3	4

	1	2	3	4
Is the department communicating learning objectives, results and improvements related to student learning to a wide audience?	No record of assessment results and changes made as a result of assessment findings.	The department/program retains records of assessment results and positive changes made as a result of assessment findings, and results are entered in assessment software system.	The department/program retains records of assessment results and changes made as a result of assessment findings, results are entered in assessment software system, and assessment results and improvements are publicly posted.	The department/program retains records of assessment results and changes made as a result of assessment findings, and results are entered in assessment software system. Assessment results and improvements are publicly posted and shared proactively with faculty, prospective students, employers and alumni in ways that facilitate their discussion.

16 Explanations:

We use some of our "global" scores, like the ETS exam results, in our open house presentations. That score, itself, is not linked to the AEFIS plan, because it doesn't fit neatly into any of our program outcomes. The program outcome would have to be something like: "The student has learned the principles of chemistry across all of its subdisciplines, during their four years at Messiah." Maybe we should add this to our assessment plan. Our student mean on the ETS exam for the past 5 years has always been between the 85th and 95th percentile.

Additional Feedback

1 Please enter any additional feedback for changes that should be made:

CLOSE AND EXIT