



Instructional Program Review Update

Directions: Enter your narrative responses after the questions. Upload report(s) that you reference in each narrative.

Submitter: Joaquin J. Rivera & Alec J. Bates

Submission Date: 11/15/2021

DIVISION: Science, Technology, Engineering, and Mathematics PROGRAM NAME: Chemistry

1.A. STATUS OF PRIOR GOAL – Goal # 1

Complete the section of questions for each goal, for instance 1.A. for the first goal, 1.B. for the second, and so on. If there are more than five goals, please contact the [Office of Planning, Research, and Institutional Effectiveness \(PRIE\)](#) to add sections.

GOAL, YEAR INITIATED, AND MEASURE OF SUCCESS IF NOT REFERENCED IN GOAL

Although success and retention rates have increased among all ethnic groups, success for African American, Hispanic/Latino and Pacific Islanders are lower than the departmental average. This shows that additional resources for student support and tutoring outside of the classroom are needed to improve student success in Chemistry courses. This might include hiring tutors, embedded tutors, offering learning skills supplement courses, supplemental instruction sessions, continue the partnership with the Math, Engineering and Science Achievement (MESA) program, partnering with existing campus learning communities and student support programs such as the Learning Center and re-instituting the CHEM 192 prerequisite for CHEM 210. In the CHEM 210 course we might implement a recitation session to increase student success.

Given that the prerequisite of CHEM 192 for CHEM 210 has been removed, it will be even more critical for students to be properly advised into the appropriate initial chemistry course and to provide the additional support for students who go directly into CHEM 210 without first completing the recommended CHEM 192.

STATUS: Ongoing Revised for this cycle New Completed Discontinued

SUPPORTING NARRATIVE FOR EACH GOAL'S STATUS (*Recommend length: not to exceed 250 words*)

- Ongoing
 - a) Roughly how much of the goal has been implemented – 25/50/75%?
 - b) What has been accomplished thus far?
 - c) What has been the impact of resources that were provided? Not Applicable
 - d) What are challenges not already documented? Not Applicable
- Revised – Explain how and why the goal has been revised: implementation plan? timelines? measures of success?
- New – Briefly explain the need for the goal, and how it aligns with the College Values.
- Completed – Note the accomplishments and to what extent the measure of success was met.
- Discontinued – Explain why.



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Hiring tutors and embedded tutors, offering learning skills supplement courses, supplemental instruction sessions, continue the partnership with the Math, Engineering and Science Achievement (MESA) program and partnering with existing campus learning communities and student support programs such as the Learning Center have been implemented. We will expand on this by working with the STEM Center. Re-instituting the CHEM 192 prerequisite for CHEM 210 has not been implemented because the other two colleges are not implementing it. In the CHEM 210 course a recitation session has been implemented to increase student success.

IMPLEMENTATION STEP(S) AND TIMELINE – FOR ONLY *ONGOING, REVISED, & NEW GOAL(S)*

List *remaining* and/or *new* implementation steps and timelines for ongoing and/or revised goals.

List implementation step(s) to achieve new goals, which can include intended changes, professional development, and/or further inquiry.

GOAL ALIGNMENT WITH COLLEGE VALUE(S) – FOR ONLY *NEW GOAL(S)*

- Social Justice
- Campus Climate
- Open Access
- Student Success and Equity
- Academic Excellence
- Community Partnership
- Participatory Governance
- Sustainability

RESOURCE REQUEST RATIONALES FOR *ONGOING, REVISED, & NEW GOALS*

(Recommended length: not to exceed 150 words for each goal)

- No Resource Request Needed

Which additional resources are needed (e.g., services from or partnerships with other areas of campus, instructional equipment, facilities, personnel, etc.)? How will they help to support the goal?

Note: Referencing the goal and implementation step(s), submit the request(s) that require funding to your dean by November 15.

1.B. STATUS OF PRIOR GOAL – Goal # 2

GOAL, YEAR INITIATED, AND MEASURE OF SUCCESS IF NOT REFERENCED IN GOAL

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Increases in the number of laboratories and increases in the cost of chemicals and equipment over the last few years should also be met with an increase of a budget to both purchase materials and chemicals. A long-term plan for maintaining, purchasing and replacing laboratory equipment is essential to staying current and being able to teach with modern technology.

STATUS: Ongoing Revised for this cycle New Completed Discontinued

SUPPORTING NARRATIVE FOR EACH GOALS' STATUS (*Recommend length: not to exceed 250 words*)

- Ongoing
 - a) Roughly how much of the goal has been implemented – 25/50/75%?
 - b) What has been accomplished thus far?
 - c) What has been the impact of resources that were provided? Not Applicable
 - d) What are challenges not already documented? Not Applicable
- Revised – Explain how and why the goal has been revised: implementation plan? timelines? measures of success?
- New – Briefly explain the need for the goal, and how it aligns with the College Values.
- Completed – Note the accomplishments and to what extent the measure of success was met.
- Discontinued – Explain why.

The budget for supplies has not been increased. Some new equipment has been purchased from yearly allocations but no long-term plan has been developed.

IMPLEMENTATION STEP(S) AND TIMELINE

GOAL ALIGNMENT WITH COLLEGE VALUE(S) – FOR ONLY NEW GOAL(S)

- Social Justice
- Campus Climate
- Open Access
- Student Success and Equity
- Academic Excellence
- Community Partnership
- Participatory Governance
- Sustainability

RESOURCE REQUEST RATIONALES FOR ONGOING, REVISED, & NEW GOALS

(*Recommended length: not to exceed 150 words for each goal*)

- Not Applicable



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Which additional resources are needed (e.g., services from or partnerships with other areas of campus, instructional equipment, facilities, personnel, etc.)? How will they help to support the goal?

Note: Referencing the goal and implementation step(s), submit the request(s) that require funding to your dean by November 15.

1.C. STATUS OF PRIOR GOAL – Goal # 3

GOAL, YEAR INITIATED, AND MEASURE OF SUCCESS IF NOT REFERENCED IN GOAL

A new full-time faculty member is needed. The FTE/PTE ratio is under 50% for the chemistry department. The hiring of a new full-time faculty member would be of great help to continuing to build and develop the coursework and expand department resources and improve student learning. In addition, having an additional full-time faculty member would help with the continuity of instruction within the chemistry program.

STATUS: Ongoing Revised for this cycle New Completed Discontinued

SUPPORTING NARRATIVE FOR EACH GOALS' STATUS (*Recommend length: not to exceed 250 words*)

- Ongoing
 - a) Roughly how much of the goal has been implemented – 25/50/75%?
 - b) What has been accomplished thus far?
 - c) What has been the impact of resources that were provided? Not Applicable
 - d) What are challenges not already documented? Not Applicable
- Revised – Explain how and why the goal has been revised: implementation plan? timelines? measures of success?
- New – Briefly explain the need for the goal, and how it aligns with the College Values.
- Completed – Note the accomplishments and to what extent the measure of success was met.
- Discontinued – Explain why.

A new full-time faculty member has not been added. We still need it. We submit a request for this every year but the request has not been granted. (Note: the Spring 2021 Chemistry faculty hire was a replacement position, for a faculty member who left in Spring 2020.)

IMPLEMENTATION STEP(S) AND TIMELINE

GOAL ALIGNMENT WITH COLLEGE VALUE(S) – FOR ONLY NEW GOAL(S)

- Social Justice
- Campus Climate
- Open Access



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- Student Success and Equity
- Academic Excellence
- Community Partnership
- Participatory Governance
- Sustainability

RESOURCE REQUEST RATIONALES FOR ONGOING, REVISED, & NEW GOALS

(Recommended length: not to exceed 150 words for each goal)

- Not Applicable

Which additional resources are needed (e.g., services from or partnerships with other areas of campus, instructional equipment, facilities, personnel, etc.)? How will they help to support the goal?

Note: Referencing the goal and implementation step(s), submit the request(s) that require funding to your dean by November 15.

2. COURSE SLO RESULTS

Upload the relevant [Improve](#) (formerly *Tracdat*) SLO reports with the last three years of course SLO results. If available, note any differences in assessment results by key disaggregations (e.g. modality, learning communities, etc.).

3. INSTITUTIONAL SLO RESULTS

When possible, concurrently assess course SLOs and ISLOs.

Report on the last three years of ISLO results which you'll receive from PRIE. Indicate if the results met the benchmark or were inconclusive. Additional commentary is optional.

ISLO	YEAR(S) ASSESSED	COURSE(S) TO ASSESS THE ISLO	RESULTS
CITIZENSHIP			
CRITICAL THINKING			
EFFECTIVE COMMUNICATION	2018	CHEM 210	23/28 Students demonstrated Proficiency or High Proficiency in Message Delivery 23/28 Students demonstrated Proficiency or High Proficiency in Information Analysis & Comprehension

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ISLO	YEAR(S) ASSESSED	COURSE(S) TO ASSESS THE ISLO	RESULTS
INFORMATION LITERACY			
LIFELONG WELLNESS			

Drawing from 2 and 3, what notable conclusions were drawn from the assessment results? If available, note any differences in assessment results by key disaggregations (e.g. modality, learning communities, etc.). What have been the implications for the program? Which course results led to action(s) that were planned or taken, if any? What efforts, if any, have been made to enhance student learning in those courses (e.g., curricular and pedagogical changes to the course; course sequencing, including complementary general education courses; adoption of OER/ZTC texts; assessment design; collaborations with other areas of campus, etc.)? *(Recommended length: not to exceed 250 words).*

Students have continued to be successful in fulfilling the Student Learning Outcomes assessed in the past 3 years. Due to the pandemic, some course assessments have been postponed and are being evaluated in the 2021-2022 academic year.

In an effort to meet the needs of our students and to help students to succeed in the Student Learning Outcomes, the Chemistry Department shifted quickly to provide home laboratory simulations as the Shelter-in-Place began in March 2020, developed custom at-home lab kits for students to use in entry-level Chemistry courses, and designed hybrid laboratory courses that included an in-person component for advanced chemistry courses for which appropriate at-home kits were not possible.

To insure that students have access to assistance inside and outside of class, the Chemistry department has been working closely with the STEM center to include embedded tutors in the classes, as well as to promote the tutoring services available from the STEM Center through the Accudemia online system.

The Chemistry Department has also worked with the STEM Center to develop Lab Report Writing Workshops for students in Introductory and General Chemistry courses to enhance SLO success at the course level and the ISLO of Effective Communication.

The Chemistry Department has adopted many online education resources, including no-cost, high-quality, online textbooks for all lecture courses, except Organic Chemistry. (Currently no appropriate free, online text is available for Organic Chemistry.) All of the laboratory courses use in-house or free online laboratory manuals. For the courses using at-home labs during the shelter-in-place semesters, the college has subsidized the kit prices, allowing for students to use the kits for the rental fee of just \$5. (The full kit prices are ~ \$225 to \$300.)



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4. CURRICULUM

Please check the boxes to indicate that the following tasks have been completed:

- Submitted a current assessment calendar with all active courses to the Office of Planning, Research, and Institutional Effectiveness
- Updated *Improve* with new or changed SLOs, and requested from PRIE the addition of new courses in order to input SLOs
 - Not Applicable
- Updated new or changed PSLOs on the program website after they are published in the College Catalog
 - Not Applicable
- Reviewed, updated (as needed), and submitted degree and certificate maps to the Curriculum Committee
 - Not Applicable

5. ADDITIONAL INFORMATION

- Not Applicable

Please note anything else that has not been captured above that is relevant to program accomplishments, challenges, and resource needs. Explain and document your response as needed.

The Chemistry Department, like all programs, faced a significant and ongoing challenge in responding to the COVID-19 pandemic. One of the many challenges encountered for science programs is offering a meaningful laboratory experience for students that fulfills the Student Learning Outcomes for the courses and properly prepares students for their future courses, transfer, and professional school requirements.

In the Spring 2020 semester, all classes went fully online as required by the shelter-in-place orders. For that semester, laboratory instructors used available online simulations (including Labster), lab videos, and data from previous semester experiments to provide the most meaningful lab experience possible under those emergency conditions.

Recognizing that online classes would likely persist into the summer and following academic year, the department quickly began working with vendors to develop at-home lab kits that would meet the specific needs of our Allied Health Chemistry (CHEM 410), General Chemistry 1 (CHEM 210), and Introductory Chemistry (CHEM 192) courses. We were able to secure enough kits for piloting / implementation for four lab sections for Fall 2020. For the Summer and Fall 2020 semesters, other sections of these courses continued to use online simulations (including Labster), lab videos, and data from previous semester experiments.



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In the Spring, Summer, and Fall semesters of 2021, all lab sections of CHEM 192, CHEM 210, and CHEM 410, which were fully online in these semesters, had at-home lab kits for all students. The college subsidized the cost of the kits and students were charged only a \$5 rental fee by the college (the kit prices varied ~ \$225 - \$300). The Chemistry Stockroom and Bookstore Staff organized and ran the distributions and collection of ~ 250-270 chemistry lab kits each of these semesters.

Because of the nature of the experiments and chemicals and equipment needed to perform them, the laboratory sections for General Chemistry 2 (CHEM 220), Organic Chemistry 1 Lab (CHEM 237) and Organic Chemistry 2 Lab (CHEM 238) were brought back onto campus in the Fall 2020 Semester. We observed the strict COVID-19 protocols for masking, distancing, and surfaces cleaning. Students met in laboratories with multiple fume hoods and wore safety glasses/goggles and gloves (as required for experimentation) in addition to masks. Lab capacities were approximately one third to one half of the standard class size (up to 12 students allowed per lab session). Students were assigned lab simulations and lab lecture videos on their asynchronous lab days to allow them to maximize their lab time for experimentation. In each course, one-half to two-thirds of the standard in-person experiments were completed. The experiments performed were selected to insure that students were exposed to each of the critical techniques and pieces of equipment required by the curriculum.

CHEM 220, 237, and 238 continued in this format for Spring 2021. They continue to meet in-person for lab in Fall 2021, however, with somewhat larger cohorts.

APPROVAL AND SIGNATURE

This document has been reviewed and approved by:

Alec J. Bates Susanne G. Schubert Joaquin J. Rivera

on 11/15/2021.