

Chemistry-FD Richard Daley - Chemistry

## 21-22 Annual Progress Report

### Recommended actions for improvement identified in the 5-Year Self-Study.

- Increase coordination with biology and physics to minimize overlaps in scheduling of course offerings
- Increase dual enrollment course offerings to help mitigate decline in enrollment (CHEM 25 and 1A at Khan Lab School; CHEM 25 at Eastside Preparatory High School)
- Consider alternative course delivery designs such as hybrid courses or online supplemental instruction to improve retention and increase enrollment
- Explore solutions to address STEM readiness issues for chemistry courses, such as workshops, new curriculum designs, embedded and peer tutors, collaboration with learning communities, and increased online support for students.

### Actions taken and progress made in accomplishing the improvement.

- Coordination with biology takes place quarterly during the schedule drafting process regarding BIOL 1A conflicts with CHEM 1B and 12A, BIOL 1B conflicts with CHEM 1C and 12B, and BIOL 1C conflicts with CHEM 12C.
- There have been preliminary discussions at the division level regarding the development of a uniform block schedule for STEM lecture courses and for STEM laboratory courses. This would significantly reduce scheduling difficulties for students since all laboratories would be offered at the same time blocks across multiple departments and have minimal overlap with other STEM lecture courses.
- We developed and implemented a new AS degree in Biochemistry in Spring 2021 in an effort to attract students who are interested in pursuing health science careers at their transfer institution.
- Two chemistry faculty members have been involved in college and statewide curriculum efforts to ensure that chemistry courses could be offered in a variety of modalities during the COVID-19 pandemic, and that these courses would be transferable to four-year institutions.
- Dual enrollment course offerings were put on hold during the 2020-2021 academic year due to the COVID-19 pandemic. However, we are offering CHEM 25 in Winter 2022 and CHEM 1A in Spring 2022 in collaboration with Khan Lab School. There are plans to offer CHEM 25 at Eastside Prep in Summer 2022.
- Moreover, many of our courses at Foothill continue to attract dual enrollment students. This applies to courses in the CHEM 1, CHEM 12 and CHEM 30 chemistry course series.
- Due to the COVID-19 pandemic, all chemistry courses were offered fully online from Spring 2020 to Spring 2021. For the 2021-2022 academic year, most courses have had at least one hybrid section with an on-campus laboratory component. A number of chemistry faculty have engaged in professional development opportunities for online course design and instruction, such as POCR and the Summer 2020 Virtual Teaching Professional Development event.
- Instructors in CHEM 1, CHEM 12, CHEM 25, and CHEM 30 programs have used embedded tutors in their courses throughout the 2020-2021 and 2021-2022 academic years. Implementation of other strategies to address STEM readiness in chemistry courses has otherwise been quite difficult due to the massive disruptions in instruction from the ongoing COVID-19 pandemic. We discussed the development of a new math "booster" course (CHEM 210) for students who need additional support for performing calculations in CHEM 30A.

### Evidence used to evaluate progress.

(ex: What data are you using to make your progress judgment?)

We offered 119 sections in the 2020-2021 academic year, an 8% increase from 110 sections in the previous academic year. In addition, we had a 17% increase in FTES from 483 in 2019-2020 to 564 in 2020-2021.

Student success rates in chemistry remained consistent at 80% for both 2019-2020 and 2020-2021 with less than a 1% change in student success rates by gender. However, there was a 2% increase in student success rates for African Americans and Filipinos, with little to no change in success rates for other student populations over the same two-year time frame.

It is difficult to differentiate whether these increases are due to all chemistry courses being offered online during the COVID-19 pandemic or due to other departmental initiatives. In fact, the online courses offered by the department during the pandemic were taught in a wide range of instructional modalities to give as much flexibility as possible to our students. This is evidence of the department's commitment to reaching out to an increasingly diverse student population with a wide range of needs.

## New trends, policies, or state initiatives that have impacted your actions for improvement.

The COVID-19 pandemic has had a tremendous impact on instruction of chemistry courses due to all courses in the department being taught online from Spring 2020 to Spring 2021. Consequently, all chemistry faculty have had some experience with online instruction and have become aware of its advantages and pitfalls. For the 2021-2022 year and beyond, the chemistry department has agreed to permit hybrid instruction for CHEM 1, CHEM 25, and CHEM 30 courses.

One key finding we all agree upon after our experiences teaching fully online courses in 2020-2021 is that our laboratory courses can only meet lab-specific student learning outcomes with in-person instruction. Various instructors within the department explored and evaluated various modalities of online lab instruction during the 2020-2021 academic year, including Hands-On Labs, Labster, and recorded video demonstrations, and found that these were not suitable replacements for on-campus, hands-on learning of laboratory techniques and concepts.

Some chemistry faculty have also adopted OERs or developed online laboratory material for their courses in an effort to reduce the cost barrier for students in the various chemistry programs. This effort is ongoing.

## Actions needed/designed to address the area of work/improvement for new trends, policies, or state initiatives.

The chemistry department will continue to engage in conversations surrounding the implementation of Guided Pathways at Foothill College. In partnership with the program mapping team, the chemistry program map was completed in the Spring 2021 quarter. This year, we will explore different meta majors that our program could be compatible with as well as continue to discuss the career and transfer opportunities that are available to students who take our courses.

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This form is completed and ready for acceptance.

Administrator's Name:

Date:

Comments: