

LDC Program Review – Annual Discipline Update for 2021-2022

PART A

SECTION 1: BASIC PROGRAM/DISCIPLINE INFORMATION

SAC Name: **Chemistry**

Disciplines included in this SAC: **Chemistry**

SAC Chair(s): **Patty Maazouz and Stephanie Bryan**

Faculty Department Chair(s): **Stephanie Bryan (CA), Danijela Vukic (RC), Mike Mackel (SE),
Jim Schneider (SY)**

Program Dean/ SAC Administrative Liaison: **Ken Friedrich (interim)**

Pathway Dean: **Alyson Lighthart**

Please highlight where your classes are offered.

Classes/Services offered at: **CA / RC / SE / SY** / NB / HC / WCC / Metro / CLIMB

Other:

SECTION 2: REFLECTING ON DATA

All data cited below can be found here:

<https://www.pcc.edu/institutional-effectiveness/program-profiles/>

***Note the row of Tabs just below your Bookmarks Bar. Begin on the Home Tab. This is where you will choose your selection criteria for your data. Return to the Home Tab whenever you want to change your selection criteria. See the Help and Data Dictionary Tabs as well as the Data Directions Document included in the email with this template for more information.

Please include data from at least the last three years and up to the last five years. A 3-year enrollment review is recommended. SACs may have unique circumstances and reasons for looking more or less broadly.

2A.Enrollment (SFTE) per year; Location (where course is taught); Modality

[SEE Student FTE Tab](#) [Chemistry 2020-21 Data Tables](#)
[Chemistry 2021 Data Comparison.pdf](#)

2A1. Does this data suggest any questions that the SAC would like to pursue?

The changes in modalities during COVID-19 and the vastness make it difficult to identify meaningful questions to pursue.

- How do we make valid conclusions when the online/ remote classes data seems inadequate, since these modalities began in Spring 2020, but weren't clearly distinguished until the 2020-2021 academic year?
- What is the clear definition of each modality, including a "blended" course?
- How is PCC distinguishing between remote courses that are fully synchronous and remote courses that are fully or partially asynchronous?
- Can the data be presented with updated tables and corresponding graphs that can help the SAC more easily identify questions to pursue?
- What could be the consequences of making program or curriculum changes based on limited data?
- Can institutional effectiveness provide the error analysis for the data, so we can be more confident identifying any possible trends?

2A2. Do the data suggest adjustments be made in your discipline, such as schedule or course offerings, with regards to enrollment? If yes, what ideas/strategies do you have that you would like to implement or have help with in the upcoming academic year?

The data, as presented, is very difficult to analyze and draw meaningful conclusions. There are also many transitions occurring at PCC that may be impacting this data. Due to so many variables regarding student enrollment and the pandemic, including the transition to a return to more on-campus classes offered in a safe environment, it is nearly impossible to predict how to adjust future schedule and course offerings based on this past data.

Some potential trends that may be indicated from the pre-pandemic data might include

- Increase the number of CH102 sections.
- Possible increase in number of sections for the Allied Health sequence (CH104).

However, we would need to follow enrollment trends in post-pandemic years to verify any real trends moving forward.

The ability for the SAC to increase the number of courses offered on campus is currently hindered by the lack of support from the administration. Currently, there is a huge gap in coverage in regards to administrative assistants, inadequate support for building access, and unclear policies for a safe return from risk assessment. More instructors would be more comfortable returning to campus if clear and consistent guidelines and on-campus support were provided.

Onboarding new instructors during the pandemic is another barrier that prevents the Chemistry SAC from offering many sections of our courses. It's very difficult to properly train and prepare a new chemistry instructor working in a remote workplace for both lecture and lab sessions.

We need more support from the administration with clear policies and plans to help return as many lab courses to campus as possible for Fall 2022.

(Provide specific examples--the time of new guidelines with more time to adjust; inform instructors when guidelines change; Instructors need to be notified when a student in their class is quarantined and for how long and COVID exposure notifications; The Testing Center needs to be opened for accommodations.)

2A3. Are there other data reports that you would find informative/useful with regards to enrollment? How would this information support decision-making for the SAC/discipline?

- In the future, it is essential that all data should be clearly available to the SAC in both a spreadsheet and in graphical form to enable more ready analysis. We prefer to start with the same reports provided for the 2020-2021 ADU report, but with the ability to manipulate the data as needed. It was extremely difficult to analyze the data this year with the format provided. The reports provided in previous years provide a great starting place, but would be greatly enhanced with accompanying graphs for year-to-year and course-to-course comparisons.
- If given one more year of remote data and the ability to distinguish between synchronous and asynchronous we may be able to establish a trend.

Potential future questions that could be helpful may include, but may not be limited to:

- Separate enrollment data for every term over these 3 years to identify a possible impact from our shift to remote learning starting in Spring 2020.
- Percentage changes in SFTE for all enrollment data compared to the overall percent changes for the college. This will allow us to determine if individual course trends are consistent with overall PCC enrollment, or just within our discipline.

- Comparison of enrollment rates in DL, Remote Synchronous, Remote Asynchronous. What were the enrollments in each of these modalities during the first couple weeks of enrollment to determine early enrollment student preference? This would guide us in decision-making for course offerings after the pandemic for courses that filled to capacity.

2A4. Is your program aware of any external influences that strongly affect recent enrollment? For example, state requirements, transferability challenges, other university policies, etc. Please explain.

The pandemic! Anecdotally, students have reported that only classes on campus fulfill transferability of classes as prerequisites for some professional programs.

2B. Course Success Rates

Data Definition: Success rate represents the percentage of students who successfully complete a course. It is calculated as:

$$\% S = \frac{\text{Number of students receiving a grade of A, B, C, P, PR, or CM}}{\text{Number of students receiving a grade of A, B, C, D, F, P, NP, I, W, PR, CM, N, UP}}$$

PR, CM, N, and UP are non-credit grades used in the Adult Basic Education program.

Success rates for gender and race are not calculated when the enrollment is less than 5. For any success rate that is not calculated, the total for that column is also not calculated.

% Success By Course and Modality

[SEE Modality Tab](#)

2B1a. Are there any courses with lower or higher pass rates than others (over time, over many sections, or a notably higher or lower rate)? If so, which ones?

- Without statistical analyses, it's difficult to identify significant differences for different modalities.
- CH100 & CH104 have a lower success rate online.
- CH221 & CH223 have a lower success rate for the hybrid modality.
- CH100, CH102, and CH151 on-campus courses have the lowest %S.
- CH101, the Allied Health (CH104, 105, and 106) and CH 242 and 243 on-campus courses have high %S.

2B1b. Are there any modalities with lower or higher pass rates than others (over time, over many sections, or a notably higher or lower rate)? If so, which ones?

2021-2022

- CH241 had an 8% higher success rate in remote Fall 2020 compared to in-person Fall 2019. Two big differences that year were (1) implementation of POGIL activities for the RC sections (similar to SY sections), and (2) remote modality.
- CH223 had similar success rates between remote and on campus/hybrid modalities.
- CH100, 104 and 151 showed the same trend: when moving from on campus to remote (not online, approved OL courses), the success rate goes down.

2B2. Strategy Insights

What strategies have you used to maintain high success rates? What can be learned that might be applied to courses with lower success rates? What are possible actions to be taken to understand/address lower success rates? Please clearly explain how your discipline intends to explore content/curriculum, pedagogy/teaching, course material selection, etc. using culturally responsive teaching approaches throughout the next year. Try to identify a realistic one year goal.

During remote operations, we have done what we can (either individually or in small teams) to provide effective learning environments while experiencing steep learning curves about online learning and overwhelming workloads. We share ideas and improve our courses or develop new ones each term. We are often providing effective learning environments with our own equipment. This level of stress and overwhelm is not sustainable.

At this point in time, we do not have enough data to establish changes in remote instruction to increase success rates. Due to the nature of the pandemic and the continual uncertainty for the timeline to transition back to in-person learning, it has been difficult to invest time and resources into something that should be temporary (remote learning).

For the next year we will work towards the following:

- Continue to look at consistent course material selection for the General Chemistry Sequence (CH221, 222, and 223).
- Continue to align the lab curriculum to easily transition from remote teaching to in-person labs to accommodate for the anticipated student COVID absences for Organic Chemistry (CH241, 242, 243) .
- Implement the CH151 and CH100 STORI projects at the different campuses district-wide.

Enrollment and % Passing By Course and Student Demographics

SEE [Gender](#), [Race](#), and [Pell Tabs](#)

2B3. The data may indicate a pattern of inequities (in gender, race, or Pell eligibility) in student enrollment or success. Please clearly explain how your program intends to explore content/curriculum, pedagogy/teaching, course material selection, etc. using culturally responsive teaching approaches throughout the next year. Try to identify a realistic one year goal.

For the next year we will work towards the following:

- Continue to look at consistent course material selection for the General Chemistry Sequence (CH221, 222, and 223). This will make it easier for students who need to move from campus-to-campus. We are also considering lower cost materials.
- Implement the CH151 and CH100 STORI projects at the different campuses district-wide. These are very accessible and are using culturally responsive materials.

2B4. What support does your SAC need to fully explore inequities in enrollment or student success? For example, are there any other data reports you would find useful to have related to student success?

Potential future data reports that could be helpful may include, but may not be limited to:

- Nursing School acceptance rates for students enrolled in online, remote, and in-person modalities of the past 5 years and the next 5 years. This may inform how we distribute courses in OL vs. on-campus offerings.
- Data to determine which chemistry courses were completed for the students accepted to the nursing programs at PCC and outside PCC. This will help us to determine which chemistry courses are preparing students for the nursing programs.
- Demographic data by modality (online versus all other modalities for CH100 and the CH104 sequence) to determine if there is a difference between the course modality that students enroll in. There is an extra lab kit cost associated with the online courses. We need to determine if this additional expense disproportionately impacts students of color.

SECTION 3: REFLECTION ON ASSESSMENT OF STUDENT LEARNING

3A. Assessment Reports

Please note: The following questions link directly to your Annual Learning Assessment Reports for the Learning Assessment Council. Feel free to cut and paste between this document and your other assessment documentation.

3A1. Which student learning outcomes from your SAC's available courses will you assess this year and will you use direct assessment strategies?

(These can be larger, program-level outcomes or course-level outcomes from your CCOGs).

We hope to learn if the CH 100 students are meeting the Quantitative Literacy/Reasoning outcome at the level 2 benchmark for the entire DSAC rubric. This project is a direct assessment of students' work. Student's will respond to a series of questions provided in the signature assignment. Once the redacted artifacts are collected, the SAC will score the artifacts according to the developed Sci/CS/M DSAC rubric.

3A2. Which courses do you plan to assess this year; how and why will your SAC choose the sections?

We will assess all sections of CH100 to obtain a broad representation of all students enrolled in this course.

3A3. In general terms, describe the assessment project for the year from implementation to data collection. What steps will you take in carrying out the project?

The chemistry SAC will assess how students are meeting the Quantitative Literacy/Reasoning outcome using the required signature assignment for Gen Ed.

- 1) Implement assessment in all CH 100 courses during the winter term.
- 2) Collect the appropriate number of redacted student artifacts from each CH 100 course to meet the sample total needed. Store in shared SAC google drive.
- 3) Assemble a SAC scoring team.
- 4) Conduct a norming session.
- 5) Assign random anonymous artifacts to members of the scoring team making sure to double up on all artifacts for inter-rater reliability.
- 6) Compile scores to determine the SAC's averages for each dimension.
- 7) Provide instructor scores to each participating member for comparative analysis.
- 8) Analyze the results and make conclusions.
- 9) Discuss possible changes in course level instruction based on results.
- 10) Implement changes beginning Fall 2022 in CH 100 courses.

3B. Response to LAC Assessment Question

Please respond to the question below, which relates to your SAC's 2020-2021 Learning Assessment Report to the Learning Assessment Council (LAC).

Commendations: Sometimes there is as much to be learned from failure as from success. It looks like Chemistry had that experience this year. In addition to all the other roadblocks and challenges we all faced across the college, of course, Gen Ed courses across the college are also gearing up to roll out Signature Assignments next year, and it is important to stress-test those assignments now and make needed improvements. This year's project, therefore, was successful in that it leads towards greater assessment success further down the road. Thank you for your honesty and for the work you are doing towards that end.

Suggestions: Please keep the LAC informed about the specific changes you have made to the SA.

Question: How will the SAC roll out the SA going forward? Will the SA be rolled out in stages? Will the SA be used in the Fall, allowing time for further refinements?

SAC Response:

Based on our inability to grade the assessment tool using the rubric, we modified the assessment tool so that the questions were written in such a way that we could use the rubric effectively. The revision also included discussions regarding the stated expectations in the worksheets that students filled out. We decided that the additional scaffolding encouraging students to evaluate their own work was useful in the introductory CH100 course, but could be removed for CH104 and CH151.

We now have 3 versions of the assessment tool: two for remote instruction and an on-campus version. We have implemented the assignment in all our CH100, 104 and 151 sections. The SAC chairs have very actively communicated to all faculty members regarding the requirement of using the assessment tool with a high degree of implementation success.

We are going to use the assessment tool again for 2021-2022. The revised assessment tools should be structured in such a way to gather usable data using the rubric. We are asking for faculty feedback in December after using the tool in the fall. The SAC is also putting together a subcommittee to review the results of the SA and the feedback from faculty. We will propose additional changes and revisions in the spring SAC meeting.

SECTION 4: ADDITIONAL ACHIEVEMENTS, CHALLENGES or OPPORTUNITIES

4A. Is there anything further you would like to share about your program's achievements at this time?

In the past academic year:

- A full-time instructor was hired to replace a vacant position at SY.
- A full-time instructor position was approved to move from SY to SE starting in the 2022-2023 academic year.
- Faculty participated in TIIP funded "Interdisciplinary Lab Revisions" project.
- A Full-time (FT) and a Part-time (PT) instructor worked on developing a fully accessible homework system that currently does not exist.--[online WebWork development](#)
- Open Oregon Grant - A group of FT and PT instructors continuing the development of WebWork questions and an OER textbook for CH151
- STORI Project Hybrid CH151 Course Development worked on by FT and PT instructors.
- STORI Project CH100OL Redesign including OER development of course materials with exception of lab. Launching Winter 2022. Worked on by FT and PT instructors.
- Professional Development (taking advantage of online offerings by FT and PT instructors)
 - Quality Matters
 - Online Learning Consortium
 - Teaching Week
 - Accessibility Training
- General Chemistry (CH221, 222, 223) instructors district-wide are testing out a new textbook and on-line homework system (Norton). This is the first time Gen Chem instructors across the district are looking to use the same resource.
- Instructors are using the information, resources and skills learned during the transition to remote learning and applying them to their face-to-face materials and course set-up.
- Continued revision and refinement of remote learning materials and laboratory experiments (although it should be noted that remote lab experiments are a dismal comparison to live, actual lab experiences)
- Writing and implementing new back-to-campus laboratory sections.
- Writing new quiz and exam questions every term due to easy student access to internet cheating websites allowing for increased academic integrity violations during the remote learning environment (rampant cheating)
- An instructor received an NCORE Fellowship, which is part of the PCC NCORE Academy and the instructor attended NCORE in the summer of 2021.

4B. Are there any challenges not described above that you would like to note here?

- Logistical issues relating to a return to campus instruction
 - difficulty with access to buildings and specific rooms
 - equipment failures due to sitting for 2 years (ex. dead batteries)
 - adapting materials to a social distanced classroom
 - Limited class sizes impacting enrollment
 - Computers on campus not updated
 - Limited support by administrative assistants on campus for printing, keys, cubicle assignments, copy codes, print center codes, office supplies, etc.
- Many students are not mastering class material in the remote environment and are having difficulty as they progress to more advanced chemistry courses.
 - CH221, CH222, and CH223 instructors teaching in person have noticed significant challenges for students who didn't master CH151, 221 and CH222 pre-requisite skills.
 - CH241 instructors teaching remotely noticed a significant decline in student's understanding of pre-requisite knowledge. Many of these students completed a year of remote learning for the pre-requisite classes.
 - More students in the remote environment are not uploading weekly assignments, lab reports, and missing quizzes compared to the percent of students who typically missed these assignments in face-to-face instruction.
- Approximately 70% of the chemistry lecture and lab sections at PCC are currently taught by PT faculty. The National American Chemical Society Guidelines for Chemistry in Two-Year College Programs recommend that at least 75% of the total chemistry offering be taught by full-time faculty.
 - FT faculty spend much time mentoring PT faculty due to high turnover of our highly qualified PT instructors. This mentoring time could be reduced if more FT faculty were hired, and FT faculty could spend more time focusing on equitable student success.
 - Mentoring in Chemistry is particularly challenging due to the following:
 - Campus-specific lab experiments due to differences in equipment and pedagogy
 - Various active learning pedagogies (guided inquiry, thinker buddy, clickers, etc.)
 - Campus-specific lab safety concerns
 - Gradual workload increased for FT faculty as more sections are taught by PT (workload creep).
 - Uncertain employment by PT faculty results in difficulties and a hesitancy to implement change and continual improvement.

- Inequitable opportunities for PT faculty engagement in SAC activities (assessment and ADU), training (lab equipment, culturally responsive teaching), curriculum development and professional development (i.e. best teaching practices for student success) due to limited funding.
 - Low participation by PT faculty, who bring a high level of diversity to SAC discussions and decision-making.
- Lack of clarity and training (paid training for PT faculty) for the learning and implementation of specific methods to address culturally responsive teaching in the classroom to support YESS work.
- High workload for PT faculty teaching on multiple campuses due to variation of course materials and lab experiments.

Remote Operation Challenges

- Inability to proctor the CH151 Competency Exam during remote operations.
- Inability to enforce academic integrity, especially with Chegg and other readily available online sources.
- Difficulties when attempting to prove academic integrity violations.
- Providing learning opportunities for multiple learning styles.
 - Kinesthetic learners lack the hands-on experiences with modeling kits and labs
 - Visual and spatial learners lack the opportunities from seeing live demonstrations
- Difficulties engaging students in active learning opportunities without required cameras, microphones, etc.

Future Challenges for students

- Inadequate preparation for hands-on lab experiments will significantly impact lab instruction when campuses return to face-to-face instruction.
- No experience collecting data with common chemistry lab equipment.
- No trouble-shooting lab equipment and critically thinking through actual experiments.
 - Administrative changes for faculty requirements to teach asynchronous (now requires OL training) and synchronous (will require minimum Zoom hours) for all other courses 1 year after moving to remote learning.
- Changing course schedules and developing new lab activities to accommodate lab kit shipping delays or lack of materials for kits due to increased nation-wide demand and supplier delays.
- Updating the SY CH101 course to meet the new needs of the CMET program.

One-College Challenges/Concerns

- Not having admins for our particular programs on our campus will result in confusion and delays in effectively running the departments.
- Not having a FDC present on campus will cause challenges for new PT faculty who often need questions answered in real time.
 - PT faculty often have scheduling challenges that are specific to PT

- PT faculty rely on a good relationship with the FDC to understand scheduling challenges
- Removing this relationship makes a PT job feel more tenuous.
- The lack of campus admin presence makes getting questions answered in a timely manner extremely challenging.
- A shift away from a campus centered FDC mentoring new faculty to current FT faculty will occur.
- Small logistical issues, such as getting keys to a campus, is becoming extremely difficult due to the lack of campus specific admins.
- Inability to confidently join a partnership for a 6-year NSF Oregon Pathways to Industrial Research Careers S-STEM Grant with the University of Oregon due to the following challenges:
 - The reorganization has left us with less faculty to work on the logistics of the grant.
 - Uncertainty in how to create and recruit a cohort for the grant with the one-college model, because the proposal requires the cohort to take classes together on a specific campus. The grant requires PCC to meet certain target numbers each year for the cohorts.
 - Uncertainty in the inability to successfully recruit a cohort with the remote classes, give the challenges to recruit students for the existing EXITO program.
 - More time is needed to join the grant as the one-college model transitions to new scheduling criteria from the one-college model that will need to be understood before participating in the grant.

4C. Do you see any opportunities in the near or long term that you would like to share?

- The faculty position moved from SY to the SE campus will be instrumental in supporting the PT faculty and better serving our students at SE.
- There is the potential to better serve our students and instructors using multiple modalities, such as hybrid courses.
- All the sciences under a single pathway Dean may result in more of our voices being heard by upper management in a way they hadn't before.
- There are more offerings and new tools available for faculty professional development.