

Curriculum Review Committee

Program Review Report for Chemistry

Date of Oral Review: December 1, 2010

Faculty representing the program: Doug Wick, Marie Villarba, Esmaeel Naeemi

Faculty representing the committee: Kayleen Oka, Robert Natoli, Scott Mahoney, Brian Smith

Next review scheduled (quarter & year): Fall Quarter 2014

Narrative

The Curriculum Review Committee members met with full-time Chemistry faculty for a ninety minute meeting during which the following topics were discussed: currency and relevancy of the Chemistry curriculum in relation to mission/outcomes; course outlines and syllabi; assessment schedule; changes in the field/program that affect curriculum; strengths and areas or improvement; program changes requested. The committee was informed by materials submitted by program faculty several weeks before the review.

Currency and Relevance: Chemistry faculty described a curriculum that supports various student needs and educational/career pathways, including health professions, science and engineering, environmental studies, and general education for non-science majors. Of note is that there is growing interest in energy, "Green" technology that requires grounding in Chemistry. Faculty also stated that students benefit when Chemistry faculty write references for student applications to medical, pharmacy, and dental programs. The Chemistry faculty strive to adjust pedagogy to the types of students in their program, and this is a challenge since Chemistry intersects with knowledge in other scientific fields. While in the past the Chemistry curriculum may have been directed mostly to science and engineering students, other students are now accessing the curriculum. To make Chemistry accessible, the curriculum is now being delivered in such a way that students experience it and then reflect upon that experience.

Course Outlines and Syllabi: The Chemistry faculty state that there is not enough communication between faculty at the district level and so the course outlines have not changed in recent years. In fact there are differences in Chemistry curriculum across the district: Seattle Central faculty are able to cover more material in General Chemistry because prerequisites are enforced and thus students are prepared at the same level to benefit from the course. (The Chemistry placement test helps to position students correctly.) There is some general agreement to the Chemistry series across the district, but there is not exact correspondence between courses. Thus it is problematic to have course outline concurrence across the district.

Assessment Schedule: The committee stated that the assessment schedule is in excellent shape. Chemistry faculty explained that the instructional assessment grant provides detailed guidelines as to what instructors and students are doing with respect to the American Chemical Society exam. Results show that Seattle Central students are outperforming their peers throughout the country. Chemistry faculty might consider using outcomes from the assessment schedule on the course syllabi. The committee encouraged Chemistry faculty to emphasize collaborations with other programs including professional/technical programs that are dependent on courses offered by the Chemistry program.

Changes in the field/program that affect curriculum: While new measurement instruments have affected the practice of experimental chemistry, the Chemistry faculty believe that it serves students well to require them to figure out the problem before they use the instruments to measure results. As stated above, green chemistry and nanotechnology have entered the Chemistry curriculum in the last few years. The Chemistry faculty believe that it is important to teach students to do research. Faculty are doing this selectively now, and hope to do more of this in the future.

Areas for improvement: The Chemistry faculty see value in an online homework system and hope to develop this. With only three full-time faculty, the Chemistry faculty believe they need more full-time members to more fully carry out the aims of the program. (The number of full-time Chemistry faculty is few compared to other community colleges.) Budgetary cuts have resulted in classes being dropped, thus impacting students' opportunity and progress. Another result of having few full-time faculty and experiencing budget cuts is that faculty haven't time or resources to develop new courses to better serve Chemistry students.

Hoped-for changes: While the Chemistry department purchased 24 laptops with Gates money for use in the laboratory, troubling technical problems including non-updated software and loss of wifi connections have limited the use of the laptops; as well, the program has not had access to two of the computers purchased with the Gates grant which could be used as immediate backups. Chemistry faculty do not feel fully supported by the Information Technology department and so hope for better relations with IT in the future. Chemistry faculty state that they hope Jim Schultz, who supports laboratory work in the Chemistry program, will be employed on a full year contract; students benefit greatly from his work.

Commendations

The Chemistry program provides a strong curriculum that is designed to be responsive to several groups of students at Seattle Central, including transfer students--both Associate of Science and Associate of Arts students--and Professional/Technical students (Health occupations). The curriculum has been developed and is delivered by expert, energetic faculty who care deeply about their discipline and their students. The Chemistry faculty have created a program map that clearly and helpfully displays the scope of the program as serving several groups of students.

The Chemistry program faculty have set reasonable Mathematics prerequisites for their courses and they enforce these so that students are well prepared for a challenging Chemistry curriculum. The Chemistry placement test has also been used effectively to insure that students pursuing a science/engineering educational pathway are prepared to succeed in the General Chemistry series.

The Chemistry faculty deserve praise for the achievement of their students as measured by the American Chemical Society exam given to first year General Chemistry students. In several measures between 2008 and 2010 the Seattle Central students scores range between the 69th and 90th percentile compared to their peers across the country (mean scores=50th-51st percentile).

The Chemistry program website is informative and user friendly. The site includes faculty/staff contact information and faculty websites, program map, courses offered, class schedules, lab policies, and textbook information--among other valuable information.

In sum, the Chemistry program is great shape--a credit to the intelligence and hard work of outstanding faculty.

Concerns/Issues

The Chemistry faculty are concerned that there is an insufficient number of full-time Chemistry faculty. (The size of the Seattle Central department is smaller than comparable departments in peer institutions.) This means that classes have to be cut and there is little time to develop new courses.

The Chemistry faculty are concerned that support from Information Technology Services has been insufficient to address computer support needs of the program. The faculty also state their concern that two of the laptop computers purchased for the Chemistry program with Gates Foundation money have not been made available to the faculty and students in the Chemistry program.

The Program Review committee notes that course outlines on file at the District office have not been updated in recent years and often lack clear language about course outcomes. The committee understands that creating common course outcomes is problematic because there is not exact correspondence at the level of individual courses across the district. Given this reality, an issue for the Chemistry faculty is whether and under what conditions to work with Chemistry faculty across the District to update the course outlines. The committee members don't claim to know the best course of action in this matter; it may be that there is a need for guidance from the Dean of the Science/Math division and/or the Vice President of instruction.

The Program Review committee also notes that some of the course syllabi lack statements of expected course outcomes. Other concerns are that some syllabi lack the required ADA statement and that some syllabi risk violating college policy in assigning grades for class attendance. The committee suggested that grading for class participation is a non-controversial, effective way to reinforce student presence and engagement in the classroom.

Committee Questions & Program Responses

The Committee asked Chemistry program faculty to submit syllabi that were missing in the original review portfolio: The faculty did so promptly following the review.

Committee Recommendations

- The Committee recommends that Chemistry program faculty work with their dean to develop a strategy for addressing the problem of outdated course outlines that lack statements of expected course outcomes. This work would seem to involve communication with faculty at the other district colleges whose individual course contents don't exactly match the equivalent courses at SCCC, and thus would be very challenging for faculty who are very busy with the work of teaching hundreds of students each quarter. It thus seems important the college administrators provide guidance about how to proceed.
- The Committee recommends that Chemistry program faculty revise their course syllabi to include statements of expected learning outcomes.* (The committee members would be happy to consult with the faculty about this if they think this would be helpful.) Also recommended: revise syllabi to include the ADA statement and exclude statements that students will be graded for class attendance.

*Note: Regarding syllabi, committee members note that the course syllabi lacked statements of learning outcomes, statements to the effect "...by taking this course students will be able to..." Committee further explained that learning outcomes are not topics and, as a general rule, a course should have four or five outcomes.

Report prepared by: Brian D. Smith

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