Assessment: Assessment Unit Planning

Program Review 2014-15

YC - Chemistry Program Review

Year Under Review : 2014-15
Type of Review: Self-Study (4-year review)
Program Description : A1. Do students have access to curriculum-specific and/or program-specific support services? If so, describe this(these) service(s). If not, explain why.

Students in the majors/transfer level chemistry courses (Chem 1A, 1B, 18A, and 18B) have access to the Math, Engineering, Science, Achievement (MESA) program which provides students with on-demand tutoring as well as being an invaluable resource in assisting students with career-goal planning, scholarship information, personal statement writing and finding internship opportunities, among other services.

Students are occasionally involved with EOP&S. Students are occasionally involved with DSP&S although their success rate is sporadic at best.

Students who have previously completed chemistry coursework at Yuba College are used as student tutors at the College Success Center (when available and willing).

A2. If services are available, how do they demonstrate an increase in student success?

In some cases this service may increase student success: student feedback indicates that some tutors are quite valuable to the current students. In other cases, tutors are overwhelmed by student demand for their services and/or are not suitably skilled in teaching methodology.

B3. How is current and previous program review data used to refine and improve program or department practices?

Program faculty and staff members monitor needs for additional funding, equipment and staffing and submit formal requests as appropriate.
Success rates in assessed SLOs are deemed satisfactory
Executive Summary (Include a list of team members): John Langston, chemistry faculty
Kevin Orton, chemistry faculty
01IP. Department Goals (Click '?' for Prompt): The Yuba College Chemistry program:
develops and assesses program and course SLOs; effectively and efficiently uses our resources; utilizes effective modes of delivery for our courses; designs our program in such a way as to allow students to complete their educational goals in a timely manner; evaluates our program, services and processes to ensure continuous quality improvement; strives to exemplify educational excellence, fiscal responsibility, cultural awareness, and civic engagement for our communities and region.
02IP. Access to Support Services (Click '?' for Prompt): -Office Hours, -DSPS, -EOPS, -Counseling Services
03IP. Follow up to question 02IP (Click '?' for Prompt): Yes. Students have equitable access to services.
Services are appropriate. Services are generally reliable although Introductory Chemistry students report experiences with student tutors of widely varying skill level - sometimes to the detriment of the process. Improved quality control is recommended for this service.
04IP. Degrees/Certificates (Click '?' for Prompt): 11 (chemistry AS)
05IP. Improve Completion (Click '?' for Prompt): Utilize MESA Program facilities and services. It has been noted that in the majors courses (Chem 1A in particular), students who meet the Chemistry prerequisite by passing Chem 2A at Yuba College seem to significantly outperform students who meet the chemistry prerequisite from their high-school experience only. It might be worth investigating the prerequisites for the course.
06IP. Course Outlines (Click '?' for Prompt): Yes.

07IP. Collaboration (Click '?' for Prompt): N/A
08IP. Catalog Currency (Click '?' for Prompt): No changes are needed for the catalog except for adjustments based on changes dictated by Math program. Chemistry 60 has been inactivated.
09IP. For CTE Programs Only (Click '?' for Prompt): N/A
10IP. DE Students (Click '?' for Prompt): N/A
11IP.Disproportionate Impact(Click '?' for Prompt): Disproportionate impact is not an issue in this program.
12IP. Mapping (Click '?' for Prompt): Yes
13IP. Course SLOs (Click '?' for Prompt): Chemistry faculty assess and analyze course SLOS for all courses on a regular basis as per the suggested timeline provided by the Yuba College SLO Committee. All data and analysis are reported via TracDat.
14IP. Program SLOs (Click '?' for Prompt): Chemistry faculty members assess and analyze program SLOs on a regular basis as per advice of the Yuba College SLO Committee. All data and analysis are reported via TracDat.
15IP. Professional Development (Click '?' for Prompt): Chemistry faculty members routinely engage in professional reading in the discipline and freely share relevant findings among themselves via discussion, email, bulletin board postings, etc. Such information is shared with adjunct faculty members as appropriate. Both full-time faculty members are long-standing members of the American Chemical Society and the Two-Year College Chemistry Consortium. Faculty members also participate in a wide variety of District and College committee activities, e.g., Academic Senate, District Technology Committee, College Faculty Staffing Committee, hiring committees.
16IP. Reflection (Click '?' for Prompt): Chemistry faculty members evaluate program practices on a constant, on-going basis. Program modifications are implemented on an as-needed basis.
Are you ready to submit your final program review?: Yes

Program Recommendation: Purchase of Equipment for Chemistry labs

Since the inception of Chemistry 18A and 118B, past program reviews have addressed the need for specific equipment for the lab. These include a bench-top NMR, and FTIR, reflectometers, and a UV-Visible spectrophotometer, melting stations, and a second Gas Chromatography devise. When monies are available, it would be prudent to obtain as many of these items as possible to provide a level of laboratory rigor that one would find in most organic chemistry laboratories. Given that the Chemistry Department at Woodland Community College has been allocated monies to procure some of these items (the NMR), it would be prudent for Yuba College to do likewise in order to provide consistency in instruction across the district. Additional replacement equipment for all chemistry labs are also needed, such as replacement colorimeters. Additionally, the computers currently being used for computer assisted data acquisition were purchased in 2005/2006 and are in need of either new batteries or upgrading.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2013-2014, 2014-2015
Request Date: 10/13/2015
Supporting Evidence : The majority of organic chemistry teaching labs include instrumental analysis of the products of synthesis reactions. For example, Butte Colleges course catalogue note the following for their second semester organic chemistry course: "Laboratory work includes advanced techniques in reaction conditions, product separation, purification and spectroscopy."

The requests for equipment had shown up in prior program reviews as well as in the original proposal for the AS degree in Chemistry.

Plan of Action

Equipment - Continue to advocate for, via Program Review, the need for this equipment and then wait for our Program Review process to recognize the need for this equipment by the Chemistry Department. WCC's Program Review process recently recognized their Chemistry Departments need for similar equipment and allocated funds to purchase the NMR. Adding the NMR and FTIR equipment to our teaching lab would (1) provide an improved learning environment for our students by providing hands-on experience with collecting and analyzing their laboratory-generated chemical products and (2) put Yuba College in parity with other community college Chemistry programs that have access to such equipment, including our own sister campus, WCC. (Active)

Budgetary Impact: The NMR can be purchased at an approximate cost of $20,000, while the FTIR for about $12-15,000. The other equipment (not including computers) could be purchased for under $10,000 total).
Timeline/Responsible Party: ASAP. Would be nice to have equipment by Summer, 2016 to allow time to implement into curriculum.

DE Related: No

YC - Chemistry Program Review

HSI Related: No
YC - Location: Marysville Campus

Program Recommendation: Immediately implement new course, Chemistry 18A/B: Organic Chemistry. THIS RECOMMENDATION HAS BEEN PARTIALLY ACCOMPLISHED.

The Yuba College Chemistry Department recognizes and agrees with the American Chemical Society (ACS) Guidelines for Chemistry in Two-Year College Programs recommendations that, "the chemistry curriculum must be driven by the needs of the students, the mission of the institution, and the standards of the discipline." In this regard, Chemistry 18A/B, Organic Chemistry for Health and Life Sciences has been developed. A course outline has been prepared and approved.

The program has recently completed the processes necessary to initiate an Associates Degree in Chemistry. To obtain this degree, students will be required to complete Chemistry 18A/B. Chemistry 18A/B will meet the needs of students who plan to transfer to a four-year institution to pursue studies in the natural and life sciences. The chemistry department is prepared to offer Chemistry 18A/B effective with Fall semester, 2012. With regard to chemistry laboratory practices, ACS Guidelines recommend, "At least 50 square feet of net space per student should be provided, including lab tables and benches." Current laboratory square footage is approximately 1000 sq. ft. Current enrollment caps allow for only 42 sq. ft. per student, 17% less that guideline standards. Additionally, ACS Guidelines recommend a maximum of 20 students per instructor for an organic chemistry laboratory. The Chemistry department therefore recommends that Chemistry 18A/B be capped at 20 students.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2012-2013
Request Date: 02/03/2012
Supporting Evidence : Transfer degree requirements.
Evaluation Plan: Count number of transfer students.

Plan of Action

Curriculum/SLO - As of Spring 2012 semester, Course outline of records for Chemistry 18 A and 18B have been constructed and approved. The paperwork for the Associate Degree in Chemistry has been completed and sent to Curriculum Committee for approval. Currently obtaining necessary supplies to offer the firs semester course, Chemistry 18A in the Fall 2012 semester. (Active)

Status

Reporting Year: 2015-2016 03/18/2016
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
Associates Degree in Chemistry is currently active. A revised AS Degree in Chemistry has been launched in CurricUNET and is awaiting approval.

10/09/2012
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
Chemistry 18A is currently being taught at Yuba College during the Fall 2012 semester. Initial student enrollment was a robust 13 students. Expect increased enrollment as students become more aware of the course offering.

The Associates Degree was approved by the Board and went to the State Chancellors office, which sent it back to Yuba College for minor revisions. Currently the Associates Degree proposal has been sent back to the State Chancellors office and is awaiting approval.

Related Goals

YC - Chemistry Program Review

YC - Chemistry Program Review

YC Goal 5 - Prepare students to advance to an institution of higher learning with the necessary skills and information for success, including academic knowledge and procedure, critical thinking skills, and communication skills. Use contemporary technology, equipment and methodology.

Program Recommendation: Hire additional chemistry faculty member(s) to meet current and future needs.

H21. Does this program or department have adequate full-time faculty to support a high quality program? Please explain.

No. An additional full-time faculty member is needed to allow us to deliver additional course sections (Chemistry 2A could be offered as an evening course; Chemistry 2A and Chemistry 1A/B often have full day sections so additional day sections should be offered. Chemistry 60 cannot be offered (for vocational health-science students) until additional faculty members are hired. As of next semester, perpetually existent sections of Chemistry 1A/B will need to be cancelled unless additional faculty members are hired.

Historically, this program has not been able to locate an adequate quantity of adjunct faculty members. In most cases, when they are found, they are available only temporarily.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2012-2013
Request Date: 11/01/2013
Supporting Evidence : (Data on file in TracDat: Chemistry 2013-14 Data FTES.FTEF.WSCH.pdf)
Evaluation Plan: Calculate FTES and WSCH for all course sections (including prospective new sections)

Plan of Action

Staffing - Faculty - Faculty position request submitted to President. (Active)
Budgetary Impact: Varies by experience
Timeline/Responsible Party: Langston/Orton

Status

10/09/2012

Recommendation Progress: Recommendation Needs Improvement/Attention
Faculty position request re-submitted on annual basis.

Staffing - Faculty - Faculty position request to be submitted to President. (Active)
Budgetary Impact: Varies by experience
Timeline/Responsible Party: Fall 2013 / Langston and Orton
Perkins Eligible: No
DE Related: No
HSI Related: No

Related Goals

YC - Chemistry Program Review

YC Goal 5 - Provide an understanding of the chemical aspects of the natural world needed to make informed decisions concerning self and society. Satisfy the general education requirement for graduation.

Program Recommendation: Implement new course, Chemistry 60: Allied Health Chemistry THIS RECOMMENDATION HAS BEEN POSTPONED INDEFINITELY.

YC - Chemistry Program Review

The department is in process with establishment of a new course, Allied Health Chemistry (Chemistry 60) which is analogous to Introductory Chemistry (2A), to more appropriately serve health science vocational students, i.e., those in Nursing, Veterinary Technology and Radiologic Technology, should these programs elect a change in their prerequisites. Formalization of a new course outline is in progress. (Additional faculty staffing is required to implement this course without sacrificing the capability of the program to offer a sufficient number of course sections to meet the current demand for Introductory Chemistry.)

Recommendation Priority: 1. Low Priority
Year(s) Requested: 2013-2014
Request Date: 11/01/2013
Inactive Date: 07/01/2015
Supporting Evidence : Student attrition rates in Chemistry 2A and 2B. Request from Veterinary Technology program for a chemistry course which is highly relevant to their program needs.
Evaluation Plan: If the course is implemented and vocational health-science programs such as Veterinary Technology and Nursing elect to direct their students to enroll in it, student attrition rates will be compared to the current attrition rates in Chemistry 2A and 2B.

Plan of Action

Curriculum/SLO - Course outline created and submitted to Curriculum comittee. (Active)
Budgetary Impact: None.
Timeline/Responsible Party: Langston

Status

10/09/2012

Recommendation Progress: Recommendation Needs Improvement/Attention
Course has been added to curriculum and can be implemented should the allied health programs elect a change in their prerequisites. Course implementation requires additional faculty staffing.

Curriculum/SLO - Course outline has already been written and approved by Curriculum committee. (Active)
Budgetary Impact: Will require hiring additional chemistry faculty position to allow offering of additional course.
Timeline/Responsible Party: Course outline has already been written and approved by Curriculum committee./ Langston
Perkins Eligible: No
DE Related: No
HSI Related: No

Related Goals

YC - Chemistry Program Review

YC Goal 5 - Prepare students to progress toward completion of occupational programs that are related to the natural and applied sciences.

Program Recommendation: Establish new staff position of Chemistry Tutor especially to meet the needs of formative level students. THIS RECOMMENDATION HAS BEEN POSTPONED INDEFINITELY.

I22.
Does this program have adequate technical/clerical staff to support a high quality program?

The program currently has a part-time laboratory technician but lacks adequate tutorial support for formative-level and remedial students. The program is also supported by a Division-wide secretarial position that performs a wide variety of duties.

Anecdotal evidence collected from Chemistry 2A students during several years has brought to attention various inadequacies in the current situation concerning student tutoring. Many students have reported the following to the Chemistry 2A instructor:
+ student tutors are frequently overwhelmed by demand for their services

YC - Chemistry Program Review

+ availability of student tutors is too limited
+ student tutors are unable and/or unwilling to properly police their sessions for attendees who disrupt the learning process, i.e., attendees who are inattentive and those who are seeking information or advice to circumvent learning in favor of simply finding out "the test answers"
+ student tutors occasionally demonstrate insufficient skill level in providing instruction; this is particularly true when students are pursuing a deeper understanding of the subject matter

Chemistry coursework involves a considerable amount of mathematics. Unlike the Math Department at Yuba College, the Chemistry Department doesn't have the quantity of faculty members to provide a departmental tutoring center (without faculty having a substantial amount of release time to serve as tutors for their courses).

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2013-2014
Request Date: 11/01/2013
Supporting Evidence : Student attrition rates in Chemistry 2A.
Evaluation Plan: Student attrition rates will be monitored if this position is implemented in comparison to current attrition rates in that course.

Plan of Action

Staffing - Technical/Clerical - Create position description. (Active)
Budgetary Impact: None.
Timeline/Responsible Party: Langston

Status

10/09/2012

Recommendation Progress: Recommendation Addressed/Satisfactory Progress
Position description being reseached.

Staffing - Technical/Clerical - Position description being researched and written. (Active)
Budgetary Impact: TBA
Timeline/Responsible Party: Timeline unknown / Langston
Perkins Eligible: No
DE Related: No
HSI Related: No

Related Goals

YC - Chemistry Program Review

YC Goal 5 - Prepare students with an introduction to Chemistry as a science.