# Assessment Report

# Yuba Community College District

# YC - Chemistry Program Recommendations

**Year of Review:** 2013-2014

**Type of Review:** Self-Study (4-year review)

**Executive Summary (Include a list of team members):** TBA

**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

**Industry Trends and Program Data Analysis :** C4. How do program or department goals align with the education, diversity, demographic, and workforce needs of local communities?

The Yuba College Chemistry program offers courses that meet the needs of students who have a wide variety of educational objectives, both university-transfer and vocational levels. The Chemistry program prepares students to apply fundamental chemical principles to a wide variety of natural and artificial phenomena. The subject content of the program is basic to a very wide range of areas, e.g., medicine, pharmacy and veterinary medicine; agriculture and forestry; environmental protection; engineering; food processing; manufacturing; and, scientific research.

The course offerings of the Chemistry program provide integral support for programs of study in the other natural and applied sciences. Courses are scheduled throughout the year (with sequences commencing in the fall) to as meet the demand of the local community to the best extent possible given current staffing limitations.

C5. How is your program or department direction driven by empirical data?

Planning of course scheduling is based on FTES data. Currently, there is consistently high enrollment demand so that each course is offered throughout the year as frequently as possible given current staffing limitations.
(Data on file in TracDat: Chemistry 2013-14 Data FTES.FTEF.WSCH.pdf)
Chemistry 2013-2014

| Year | FTEF | FTES | WSCH | Stu/Fac | WSCH/FTEF |
|---|---|---|---|---|---|
| 2007-8 | 3.70 | 138.49 | 4154.70 | 37.43 | 561.45 |
| 2008-9 | 3.67 | 116.23 | 3486.90 | 31.70 | 475.49 |
| 2009-10 | 2.90 | 93.40 | 2802.00 | 32.21 | 483.10 |
| 2010-11 | 2.93 | 106.90 | 3207.00 | 36.44 | 546.65 |
| 2011-12 | 3.03 | 99.20 | 2976.00 | 32.70 | 490.55 |
| 2012-13 | 3.10 | 96.30 | 2889.00 | 31.06 | 465.97 |

**Curriculum & SLO Assessment Summary :**

D6. What has your program or department done to improve completion of degrees, certificates, or transfers? What are your future plans?

Course outlines are kept current to increase the likelihood that transfer students will be successful at post-transfer institutions. The Chemistry program offers an Associate Degree in Chemistry for which all required coursework is available at Yuba College.

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D7. Do you have any courses, certificates, or degrees that should be in-activated or expanded? If yes, please identify and justify your recommendations with data.

N/A

D8. Do all of your courses have current CORs? If not, what steps are you taking to ensure compliance?

Yes.

D9. If applicable, how are teaching methodologies in your program or department assessed?

Department faculty members devote time on a regular basis to:
o reviewing latest textbooks and periodicals
o reading in the discipline to be aware of current trends and information
o reviewing websites and other web-based sources for information and innovative methods

As outlined in the YCFA/District agreement regular evaluation of full and part time faculty are completed.

D10. If applicable, how are the results of the assessment used to support, improve, and/or expand your current teaching methodologies?

Acquired information is used to ensure that chemistry courses at Yuba College are at least equivalent in rigor to analogous courses at other regional colleges and universities. Each chemistry course requires students to:

o use an up-to-date textbook
o perform laboratory assignments which emulate current trends
o utilize web-based and/or computer-based lab activities

D11. If your program or department uses a DE modality to support instruction, how are you evaluating the effectiveness of that instruction?

N/A

D12. If your department offers DE courses, what support services does it provide for DE students? What can be done to improve support services for these students?

N/A

D13. How is your program or department applying sound principles of learning and teaching theory to its curriculum?

Each course requires students to utilize a current and respected college-level textbook. Department faculty members have authored laboratory manuals to reflect current teaching trends and standards while adapting to available facilities and equipment.

D14. Which CSLOs (course student learning outcomes) and PLOs (Program learning outcomes) were assessed within the last year?

Chemistry 2A: Computation, Scientific Awareness, Critical Thinking
Chemistry 18A: Critical Thinking
Chemistry 18B: Critical Thinking

**Future Goals and Program Direction:** K27. Based on Program Review, what are your plans for future department/program improvements?

1. Continue to request additional full-time faculty member.
2. Continue to work with Personnel Office to identify and contact qualified Adjunct faculty members.
3. Continue to monitor program budgetary needs with attention to ever-increasing costs of acquisition, storage and disposal of materials and equipment.
4. When funds become available the chemistry department will purchase needed instrumentation (both new and replacement). New equipment would include an FTIR (Fourier Transform Infrared Spectrometer), a bench-top NMR, a Gas Chromatogram, and additional glassware needed for the organic chemistry courses. Also updated Chem-Draw software will be needed due to outdated computer system software and compatibility issues. The current cost for this software is about $900.00.

**Course Content and Statistical Analysis:** TBA

**Are you ready to submit your final program review?:** Yes

| Goal | Recommendations | Plan of Action & Budgetary Impact / Tasks | Status | Feedback & Follow-Up |
|---|---|---|---|---|
| YC Goal 5 - Prepare students to advance to an institution of higher learning with the necessary skills and information for success, including | | | | |

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|---|---|---|---|---|
| academic knowledge and procedure, critical thinking skills, and communication skills. Use contemporary technology, equipment and methodology. | | | | |

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| 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. | | | | |

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|---|---|---|---|---|
| YC Goal 5 - Prepare students to progress toward completion of occupational programs that are related to the natural and applied sciences. | YC - Chemistry Program Recommendations - Implement new course, Chemistry 60: Allied Health Chemistry - 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.)<br>**Supporting Evidence (SLO, WSCH, etc.):**<br>Student attrition rates in Chemistry 2A and 2B. Request from Veterinary | **Plan of Action:**<br>Course outline created and submitted to Curriculum comittee.<br>**Type:**<br>Curriculum/SLO<br>**Budgetary Impact:**<br>None. | 10/09/2012 - 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.<br>**Recommendation Progress:**<br>Recommendation Needs Improvement/Attention<br>**Reporting Year:**<br>2012-2013 | |

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|---|---|---|---|---|
| | Technology program for a chemistry course which is highly relevant to their program needs.<br>**Evaluation Plan:**<br>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. | | | |

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| YC Goal 5 - Prepare students with an introduction to Chemistry as a science. | YC - Chemistry Program Recommendations - Establish new staff position of Chemistry Tutor especially to meet the needs of formative level students. - I22. Does this program have adequate technical/clerical staff to support a high quality program?<br><br>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.<br><br>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:<br>+ student tutors are frequently overwhelmed by demand for their services<br>+ availability of student tutors is too limited | **Plan of Action:**<br>Create position description.<br>**Type:**<br>Staffing - Other<br>**Budgetary Impact:**<br>None. | 10/09/2012 - Position description being reseached.<br>**Recommendation Progress:**<br>Recommendation Addressed/Satisfactory Progress<br>**Reporting Year:**<br>2012-2013 | |

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|---|---|---|---|---|
| | + 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"<br>+ 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<br><br>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).<br><br>**Supporting Evidence (SLO, WSCH, etc.):**<br>Student attrition rates in Chemistry 2A.<br>**Evaluation Plan:**<br>Student attrition rates will be monitored if this position is implemented in comparison to current attrition rates in that course. | | | |

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|---|---|---|---|---|
| YC Goal 5 - E16. How do program or department goals align with stated Yuba College goals?<br><br>The content and skills provided by the courses in this program contribute directly to the accomplishment of College goals which relate to transfer, | | | | |

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| occupational training and the development of skills of a general nature.<br><br>The Chemistry program<br>o has developed SLOs and is involved with their assessment on a continuing basis to foster student success<br>o has faculty members who research and utilize the best available modes of instructional delivery to assure educational excellence<br>o has developed an Associate Degree to allow students to accomplish complete training in the discipline at this level<br>o provides students with progress toward completion of basic requirements for transfer to the University of California and California State University systems for career preparation in natural and applied science<br>o provides students with progress toward satisfactory completion of health science vocational programs | | | | |

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| YCCD VS 1 - E17. How does the program support the YCCD District Vision Statement? Specifically, how does the program meets the needs of our students and communities?<br><br>The Yuba College Chemistry program prepares students to apply fundamental chemical principles to a wide variety of natural and artificial phenomena. The subject content of the program is basic to a very wide range of areas, e.g., medicine, pharmacy and veterinary medicine; agriculture and forestry; environmental protection; engineering; | | | | |

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|---|---|---|---|---|
| food processing; manufacturing; and, scientific research. The course offerings of the Chemistry program provide integral support for programs of study in the other natural and applied sciences.<br><br>The Chemistry program offers courses that meet the needs of students who have a wide variety of educational objectives, including:<br><br>o courses that fulfill the freshman requirement for chemistry majors intending to transfer to four-year institutions<br>General Chemistry, Chemistry 1A/B<br>Organic Chemistry, Chemistry 18A/B<br>o preparatory courses for students entering various vocational and technical programs that also serve to meet the prerequisite for General Chemistry<br>Introductory Chemistry, Chemistry 2A<br>Introduction to Organic and Biochemistry, Chemistry 2B<br>o general education course for non-majors<br>Concepts of Chemistry, Chemistry 10 | | | | |