



Comprehensive Program Review 2022

Program Name: **Chemistry**

Semesters Reviewed:

AY 2020: Fall 2019, Spring 2020, and Summer 2020 AY

2021: Fall 2020, Spring 2021, and Summer 2021

AY 2022: Fall 2021, Spring 2022, and Summer 2022

Completed by: Doug Ecoff

Date: January 2023

Assessment Committee Recommendation:

The committee agrees with the Program Vitality Statement; Category 3: due to changing needs and retirement of full-time faculty member.

President's Council Recommendation:

Council agrees with the Assessment Committee's recommendation of Category 3.

1.0 Program Summary

Provide a descriptive summary of the program.

Narrative:

The Chemistry Department of Labette Community College provides the chemistry courses needed to obtain an Associate in Science Degree in Chemistry and Pre-Pharmacy and meets the Natural Science General Education requirements for all students. In addition, chemistry courses are required for Associate degrees in Biology, Premedical, Physics, and Engineering

2.0 Student Success

Provide a definition of how student success is defined by the program.

Narrative:

Student success occurs whenever students achieve the educational goals they want to accomplish including career goals. In addition, success is measured by completion rate and the learning that occurs in chemistry courses.

2.1 Achieve/Promote Student Success

Describe how the program achieves and promotes student success. Focus on those activities and innovation that are within the three-year comprehensive cycle.

Narrative:

The Chemistry department of LCC strives to help students to be successful. Some of the ways this is accomplished is as follows.

- Using the apprentice approach in which the instructor shows how to work problems followed by students working similar problems in class. Hands-on helps students to better understand how to problem solve and helps them to be more attentive in class.
- Tests that can be retaken in which the retake tests are similar, but not the same as the original. This gives the students another chance to learn the materials.
- Applying concepts to real-life occurrences, which helps students see relevance to the courses.
- Creating and revising experiments to help students better understand concepts and develop laboratory techniques.
- The faculty keep current on new developments in the field.

3.0 Reflection on Current Curriculum

Please describe curriculum holistically, speaking specifically to the breadth, depth, and level of the discipline. Additionally, provide narrative on the coherence of the curriculum and the processes by which the program updates and keeps curriculum relevant.

Narrative:

The content of College Chemistry 1 and 2 are in accordance with the goals determined by the Kansas Core Outcomes Groups Conference (KCOG). Additionally, new and important discoveries in chemistry have been content additions to all chemistry courses. These include, nanotechnology, global warming, new uses of mass spectrometry, quirks concerning quantum chemistry, unusual phase diagrams, and nuclear fusion. General Chemistry is a course that can be taken for any student just needing to complete their science requirement for their AA or AS degree. Organic Chemistry 1 and 2, while in the past have been good classes for students who wanted smaller class sizes to learn the material before moving on to the university, are now listed at most institutions as upper division courses (300 level or higher). This means the transferability of the courses is limited and no longer worth the risk for students to take.

3.1 Degrees and Certificate Offerings

List what degrees and certificates are offered and describe how the program curriculum supports other degrees and certificates awarded by the college (if applicable).

Narrative:

The Chemistry Department of Labette Community College provides Associate in Science degrees in Chemistry and Pre-Pharmacy. It also meets the course needs for chemistry-related fields such as Biology and Engineering. Finally, it provides general science education for courses for all other students.

CHEMISTRY

ASSOCIATE IN SCIENCE

Chemistry is the study of materials and energy. Take a chemistry class to learn more about yourself and the world around you or take more classes and earn an A.S. degree in chemistry.

Credits Required: 66-68

Major Advisor: Dr. Doug Ecoff
620-820-1151
douge@labette.edu

Recommended Course Sequence

SEM 1: CHEM 124, MATH 115

SEM 2: CHEM 126, MATH 130

SEM 3: CHEM 204, PHYS 201 or PHYS 203

SEM 4: CHEM 207, PHYS 205 or PHYS 208

After Graduation

Transfer to a four-year college to complete a bachelor's degree to work in industry, education, or government. See the wide range of career opportunities: Chemistry Careers-American Chemistry Society, <http://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers.html>

For general employment information see the Occupational Outlook Handbook; <http://www.bls.gov/ooh/>

Concentration Requirements		35
<input type="checkbox"/>	CHEM 124 College Chemistry I	5
<input type="checkbox"/>	CHEM 126 College Chemistry II	5
<input type="checkbox"/>	CHEM 204 Organic Chemistry I	5
<input type="checkbox"/>	CHEM 207 Organic Chemistry II	5
<input type="checkbox"/>	MATH 130 Calculus I	5
<input type="checkbox"/>	PHYS 201 College Physics I <i>or</i>	
<input type="checkbox"/>	PHYS 203 Engineering Physics I	5
<input type="checkbox"/>	PHYS 205 College Physics II <i>or</i>	
<input type="checkbox"/>	PHYS 208 Engineering Physics II	5
Pathway Requirements		31
Written Communication		
<input type="checkbox"/>	ENGL 101 English Composition I	3
<input type="checkbox"/>	ENGL 102 English Composition II	3
Verbal Communication		
<input type="checkbox"/>	COMM101 Public Speaking	3
Quantitative/Analytic Methods		
<input type="checkbox"/>	MATH 115 College Algebra or higher	3
Human Experience		
Choose one class		
<input type="checkbox"/>	_____	3
Human Systems/No companion Elements		
Choose one class		
<input type="checkbox"/>	_____	3
Human Systems/Diverse Perspectives		
Choose two classes		
<input type="checkbox"/>	_____	3
<input type="checkbox"/>	_____	3
Human Systems/Social Responsibility		
Choose one class		
<input type="checkbox"/>	_____	3
Natural World/Scientific Inquiry		
Met through Concentration		
Wellness Strategies/No Companion Elements		
Choose one class		
<input type="checkbox"/>	_____	1-3
Wellness Strategies/Scientific Inquiry		
<input type="checkbox"/>	PSYC 101 General Psychology	3

General Education Electives can be found on page 86

Pathway Requirements can be found on page 90

4.0 Faculty Success

Faculty success over the three-year comprehensive cycle should be highlighted in this section. The accomplishments can embrace academic achievement in the discipline, national or regional honors, campus activities that support student success, or other innovations, research, teaching, and community service.

Narrative:

Faculty keep abreast of current trends in their fields by watching webinars and reading journals such as the Chemical and Engineering News.

Community activities of Douglas Ecoff include:

- On the Board of Directors and volunteering for the Care Cupboard which provides non-food products to the disadvantaged in the community.
- Volunteer at First Baptist Church as Sunday School teacher and as video and sound technician.
- Volunteer for Stella Wells which provides food during the Christmas season for the disadvantaged in the community
- Volunteered for Food Pantry at LCC
- Advisor to Cardinal Christian Fellowship

5.0 Program Accomplishments and Reflection on Data/Trends

In this section, departments should highlight noteworthy program accomplishments over the three-year comprehensive cycle. Programs should also provide thoughtful reflection on the data provided on student success, attrition, completion, etc. Programs should also report on findings from course and program assessment data. Programs should also provide context of any trends in the data, as well as external trends that may have affected the data.

Narrative:

Accomplishments:

- Lecture videos were completed for College Chemistry 1 and 2, and Organic Chemistry 1 and 2. Complete laboratory instruction videos were made for College Chemistry 1. The purpose of these videos are to (1) help absent students make up missed work (2) to increase understanding (i.e., act as a tutor) and (3) be used as replacement for lectures in online courses.
- Some corrections and additions were made to in-house textbooks and laboratory manuals made and used in six classes.
- *Labster* Software simulated experiments have replaced or added to existing laboratory experiments.

Data and Trends:

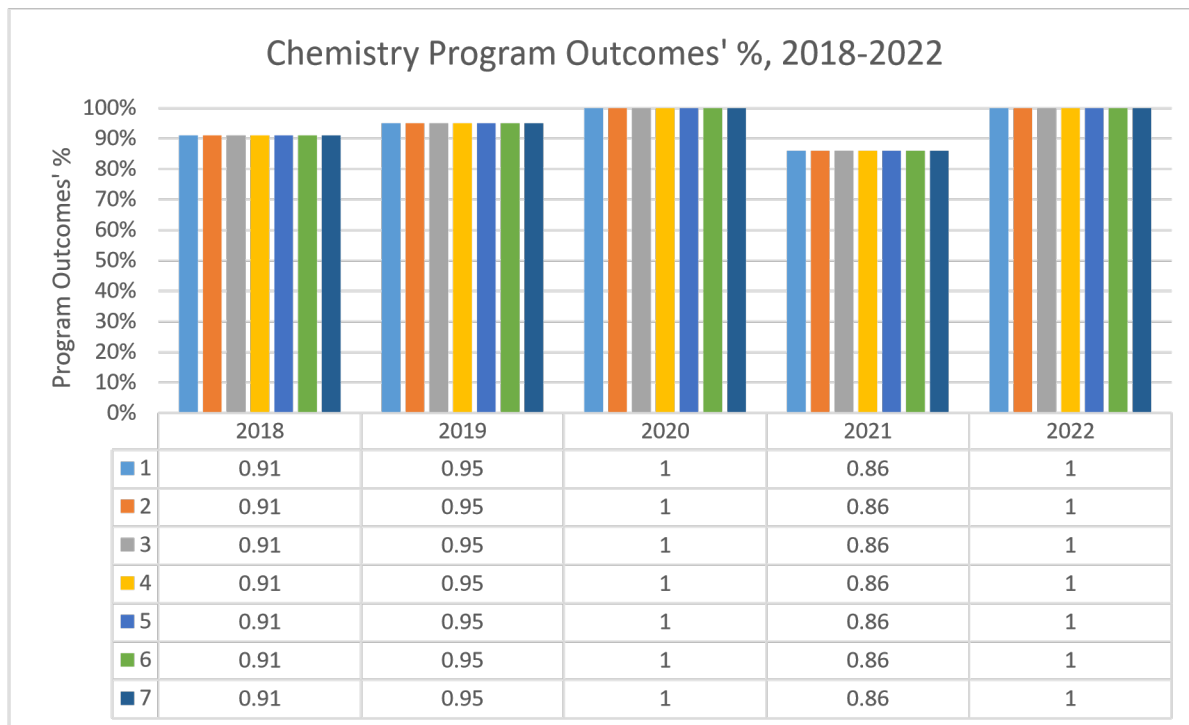
While enrollment in General Chemistry and College Chemistry I have declined rapidly over the last 3 years, enrollment in Chemistry II, Organic Chemistry 1, and Organic Chemistry 2 have stayed consistent. Student completion and success remain high in all areas except for Introduction to Chemistry. This could be because more students are taking it as their science elective, and are not Chemistry majors.

All courses have been taken either on main campus or through our concurrent locations. Enrollment at both locations has declined by approximately 50% in the last 3 three years, which is not good. We have added back

a Chemistry class at LCHS that will hopefully bring back up the concurrent enrollment numbers in this next academic year data. Students at the concurrent level tend to be more successful in passing the courses, which matches the trend overall due to more instructor and class time overall.

The Chemistry degree saw an increase in graduates from 0 to 2 in the last 3 years. This degree is very robust and heavy on science courses, so the increase to 2 is good overall.

Full-time faculty still teach a majority of the courses, with currently only 1 adjunct at the concurrent level.



1. What did you learn from this past year's program data?

- There was an increase from 2018 to 2019 and I would attribute this to notebook changes and addition of lecture and laboratory videos to the courses.
- There was a marked drop after 2019. I would attribute this to the pandemic and shift to on-line learning.

2. What did you not learn from the data?

- Details about the needs or problems associated with each individual course.

3. What do you hope to learn and/or do for this upcoming school year?

- Perhaps to determine more ways online can be used, but without detrimental loss of student learning.

6.0 Mission Alignment

Programs should indicate how the program's offerings align with the LCC mission: Labette Community College provides quality learning opportunities in a supportive environment for success in a changing world.

Narrative:

This is repeated from 2.1 Achieve/Promote Student Success above.

The Chemistry department of LCC strives to help students to be successful. Some of the ways this is accomplished is as follows.

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- Tests that can be retaken in which the retake tests are similar, but not the same as the original. This gives the students another chance to learn the materials.
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- The faculty keep current on new developments in the field.

7.0 Fiscal Resource Narrative

Based on program data review, planning and development for student success, programs will complete the budget worksheet to identify proposed resource needs and adjustments. Resource requests should follow budgeting guidelines as approved by the Board of Trustees for each fiscal year. The resource requests should be used to provide summary and detailed information to the DOI/VPAA and other decision-makers and to inform financial decisions made throughout the year. In the narrative below, please explain any requests for additional dollars over the current academic year budget, then include the budget amounts on the budget worksheet.

Narrative:

Fiscal Resource Requests/Adjustments

Material fees will need to increase for this academic year:

Requested Material Fees for 2023-2024 fiscal year:

- All chemistry on-line classes (Introduction to Chemistry, College Chemistry 1, and College Chemistry 2)- \$100 per student to pay for Labster fees (10 modules) and material fees for four one-ground experiments and photocopying costs and binders.
- All on-ground chemistry classes – maintain \$75 per student to pay for Labster fees (5 modules) and material fees for seven on-ground experiments and photocopying costs and binders.

8.0 External Constituency and Significant Trends

An important component of maintaining a superior program lies in awareness and understanding of other possible factors that may impact the program and/or student outcomes. After consideration of these other factors, program directors/faculty should document the relevant information within this section.

Program Advisory Committee:

None

Other External Constituencies:

Significant Trends:

Below is the job outlook information from the U.S. Bureau of Labor Statistics.

Overall employment of chemists and materials scientists is projected to grow 6 percent from 2021 to 2031, about as fast as the average for all occupations.

About 8,200 openings for chemists and materials scientists are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labor force, such as to retire.

The median annual wage for chemists was \$79,430 in May 2021.

The median annual wage for materials scientists, which is a closely related field, was \$100,090 in May 2021.

9.0 Program Vitality Assessment

Program faculty should use all available information to consider the category assignment which best reflects the program's current status and subsequent goals and anticipated action plans.

Vitality Category Chosen: Category 3—Revitalization Opportunities or Needs

The enrollment of classes has steadily been in decline over the last few years. It is believed that this is due to two factors. One is the popularity of online classes. Students are choosing online classes over on-ground classes. The second is the requirement of KBOR colleges of forty-five-hour upper division hours for a bachelor's degree. Because community college courses cannot transfer as upper division classes and because Organic Chemistry 1 and Organic Chemistry 2 are numbered as upper division classes at the state 4-year colleges, many students are electing to take these classes at the 4-year colleges so they do not have to take additional courses to meet this requirement.

Thus, the Chemistry department is recommending that College Chemistry 1 and 2 be offered as online classes in addition to their offering as on-ground classes. Additionally, that offering Organic Chemistry 1 and Organic Chemistry 2 be discontinued, at least in the near future.

Vitality Indicators that Could Impact Chosen Category

The Chemistry department recommends the continuance of the department, but with the reduction of offering Organic Chemistry 1 and 2 as stated previously.

10.0 Program Goals

Each program should set 1-3 short-term goals (will be completed in the next year) and 1-3 long-term goals (will be completed by next comprehensive program review). These goals should be SMART goals that can be reflected upon in the upcoming annual or comprehensive review.

Short-Term:

1. To increase enrollment and to increase flexibility of scheduling by adding online courses.
2. To improve financial vitality by removing Organic Chemistry 1 and 2 as offerings for the near future.

Long-Term:

To develop laboratory videos for College Chemistry 2 so students will clearly know how to do the on-ground experiments. Quality of the videos will be judged by student surveys, laboratory report improvements, and observations by instructor during laboratory work. If these indicators warrant it, the videos could be replaced by better videos.

Declared Awards, Transfers, and Placements

Year (AY Dates)	# of Degrees/Certs Awarded	# of Graduates Transferring from previous AY year	% Placement Rate for Graduates (CTE Only)
2020	0	0	N/A
2021	0	0	N/A
2022	2	2	N/A

Student Credit Hours by Faculty Type

Year (AY)	Number of Faculty		Student Credit Hours by Faculty Type				Total Credit Hours
	Full Time	Part Time	Full Time	% for Full Time	Part Time	% for Part Time	
2020	2	2	420	65%	225	35%	645
2021	2	1	360	73%	130	27%	490
2022	2	1	240	69%	110	31%	350

Faculty Name by Type for Most Recent Academic Year

Full Time: Douglas Ecoff, Tom Brungardt

Part Time: Cordaro Baldwin