

Program Review Summary Page
For Instructional Program

Program Area(s) of Study under Review: Chemistry

Term/Year of Review: Fall 2019

Summary of Program Review

A. Major Findings

1. Strengths

1. Chemistry is in a growth phase.
2. Demand is strong and has increased over the past three years.
3. Fill rates are among the highest in the institution.
4. AS degrees associated with Chemistry accounted 70.5% of those conferred in 2018-2019.
5. The curriculum is current and up to date.

6. Areas for Improvement

1. Retention and completion rates in classes associated with math (Chem 110, Chem 120, Chem 121) are lower than the institutional average.
2. Equity analysis shows that the retention rate for African Americans, and the completion rate for African Americans, Hispanic (e)-3 (in)2.2 e f (e)5.2 r(ri)2t[e.J 0 Tc 0 Tw 20.924 0 Td (
3. SLO3 (safety and technique) in all chemistry courses is not easily assessed and the data does not map to any institutional learning outcomes.

4. Projected Program Growth, Stability, or Viability

Chemistry is a gateway class to degrees in biology, geology, engineering, chemistry, and nursing, so it is in high demand. Chemistry was associated with 70% of the degrees conferred in 2018-2019. The chemistry program is currently in a growth phase and trend is likely to continue into the foreseeable future.

B. New Objectives/Goals.

The goal is to increase retention and completion rates for all students, including equity students, increase productivity, and have a meaningful set of SLOs for the chemistry curriculum. To meet these goals, the chemistry program proposes the following set of objectives:

1. Prepare students for STEM prior to entering NVC. It is proposed that the NVC STEM faculty meet with their counterparts in the local high schools to come to an understanding of the expected level

I. PROGRAM DATA

A. Demand

1. Headcount and Enrollment

| | 2016-2017 | 2017-2018 | 2018-2019 | Change over 3-Year Period |
|------------------------|-----------|-----------|-----------|---------------------------|
| Headcount | | | | |
| Within the Program | 820 | 839 | 914 | 11.5% |
| Across the Institution | 8,930 | 8,843 | 8,176 | -8.4% |
| Enrollments | | | | |
| Introductory Chemistry | 650 | 677 | 736 | 13.2% |
| CHEM110 | 596 | 613 | 661 | 10.9% |
| CHEM111 | 54 | 64 | 75 | 38.9% |
| General Chemistry | 251 | 266 | 323 | 28.7% |
| CHEM120 | 169 | 171 | 196 | 16.0% |
| CHEM121 | 82 | 95 | 127 | 54.9% |
| Organic Chemistry | 83 | 87 | 75 | -9.6% |
| CHEM240 | 49 | 48 | 47 | -4.1% |
| CHEM241 | 34 | 39 | 28 | -17.6% |
| Within the Program | 984 | 1,030 | 1,134 | 15.2% |
| Across the Institution | 36,525 | 36,115 | 32,545 | |

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Program Reflection

Programs in the STEM field have seen a surge in enrollment in recent years. Jobs are plentiful and well-paying. Chemistry is a gateway program in STEM which is required as a prerequisite by many of the STEM programs.

as a consequence, we have enjoyed an increase in enrollment. Students that enroll in chemistry are sticking with it longer. In the past, the primary path of students taking Chem 110 has been as a prerequisite for the Nursing Program. Fewer students are choosing this path, while the Introductory class enrollment has increased by a modest 10.9%, we have seen a larger increase in the more advanced classes because more of these students have decided to go into STEM fields rather than nursing program.

Organic chemistry has a very specific path. Students taking Organic Chemistry tend to major in Chemistry, Chemical Engineering, and Biology. We are seeing fewer students moving into these fields as students prefer Engineering majors that do not require Organic chemistry or only require one semester of organic chemistry in order to complete the major.

We expect this trend to continue. The numbers in our Introductory classes will continue to rise as more students will move into the more advanced chemistry classes in pursuit of their engineering degrees, but second semester organic chemistry will remain lower than the other classes because of the specialized nature of the need.

2. Average Class Size

| | 2016-2017 | | 2017-2018 | | 2018-2019 | | Three Year | |
|------------------------|-----------|--------------|-----------|--------------|-----------|--------------|----------------------|-------|
| | Sections | Average Size | Sections | Average Size | Sections | Average Size | Average Section Size | Trend |
| Introductory Chemistry | 31 | 21 | 29 | 23.3 | 31 | 23.7 | 22.7 | 13.2% |
| CHEM110 | 27 | 22.1 | 25 | 24.5 | 27 | 24.5 | 23.7 | 10.9% |
| CHEM111 | 4 | 13.5 | 4 | 16 | 4 | 18.8 | 16.1 | 38.9% |
| General Chemistry | 10 | 25.1 | 11 | 24.2 | 12 | 26.9 | 25.5 | 7.2% |
| CHEM120 | 6 | 28.2 | 6 | 28.5 | 7 | 28 | 28.2 | -0.6% |
| CHEM121 | 4 | 20.5 | 5 | 19 | 5 | 25.4 | 21.7 | 23.9% |
| Organic Chemistry | 4 | 20.8 | 4 | 21.8 | 4 | 18.8 | 20.4 | -9.6% |
| CHEM240 | 2 | 24.5 | 2 | 24 | 2 | 23.5 | 24 | -4.1% |
| CHEM241 | 2 | 17 | 2 | 19.5 | 2 | 14 | 16.8 | |

Program Reflection:

The chemistry program carefully plans the number of sections offered to correspond to the anticipated demand. We err on the side of too few sections when demand is unclear and then add sections as necessary. This keeps our fill rates high at or near capacity.

A direct consequence of the way we plan our sections is that our productivity has increased over the last few years. Productivity is measured as the ratio of the number of FTES to FTEF. To increase this number we must either increase the number of students in our sections or increase the number of full time equivalent faculties. At the moment, neither of these strategies are possible and is very likely unwise to attempt to increase productivity in chemistry using our current facility. An increased number of students is a safety issue.

II. CURRICULUM

| Subject | Course Number | Date of Last Review | Has Prerequisite* Yes/No | In Need of Revision | To Be Archived | No Change |
|---------|---------------|---------------------|-----------------------------|---------------------|----------------|-----------|
| CHEM | 110 | 2019 | | | | |

III. LEARNING OUTCOMES ASSESSMENT

A. Status of Learning Outcomes Assessment

Learning Outcomes Assessment at the Course Level

| Number of Courses | Number of Courses with Outcomes Assessed | | Proportion of Courses with Outcomes Assessed | |
|-------------------|--|-------------------|--|-------------------|
| | Over Last 4 Years | Over Last 6 Years | Over Last 4 Years | Over Last 6 Years |
| 6 | 6 | 6 | 100% | |

IV. PROGRAM PLAN

Based on the information included in this document, the program is described as being in a state of:

Viability

Stability

Growth

*Please select ONE of the above.

This evaluation of the state of the program is supported by the following parts of this report:

1. 1A.1– Despite the campus wide decline in enrollment, chemistry has enjoyed a 15.2% increase in enrollment.
2. 1A.2– The average class size has increased by 10

Note: Resources to support program plans are allocated through the annual planning and budget process (not the program review process). The information included in this report will be used as a starting point to inform the development of plans and resource requests submitted by the program over the next three years.

Description of Current Program Resources Relative to Plan:

1. STEM Summit The Unit Plan for S&E includes a budget for a Summer Bridge Program.

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Feedback and Followup Form

Completed by Supervising Administrator:

Robert Van Der Velde

Date:

11/15/2019

Strengths and successes of the program evidenced by

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| Library & Learning Materials | |
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