**Colorado State University – Pueblo Academic Program Assessment Report for AY 2016-2017** **Due: June 1, 2018**

**Program:**____Chemistry, M.S._____ **Date:** __June 7, 2018_____

**Completed by:**__Richard Farrer_____

**Assessment contributors (other faculty involved in this program's assessment):** __none_____

**I. Program student learning outcomes (SLOs) assessed in this cycle, processes, results, and recommendations.**

| A. Which of the program SLOs were assessed during this cycle? **Please include the outcome(s) verbatim from the assessment plan.** | B. When was this SLO last assessed? Please indicate the semester and year. | C. What method was used for assessing the SLO? **Please include a copy of any rubrics used in the assessment process.** | D. Who was assessed? Please fully describe the student group(s) and the number of students or artifacts involved. | E. What is the expected achievement level and how many or what proportion of students should be at it? | F. What were the results of the assessment? | G. What were the department's conclusions about student performance? | H. What changes/improvements to the program are planned based on this assessment? |
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| 1: Chemistry MS students will be able to evaluate the scientific literature and to use it in their courses and research. | Spring 2017 by Richard Farrer. | This SLO is assessed through both performance in coursework and performance during thesis committee meetingsAll 500 level courses involve | CHEM502(3 students), CHEM510(2 students), CHEM511(0 students), CHEM519(1 student), CHEM519L(1 student), CHEM529(5 students), | All students should receive a grade of A or B in all graded courses. All students should have positive reviews from | All students progressing toward thesis defense and graduation. No student is currently below the 3.0 GPA requirement . | All students progressing toward completion of degree. | None. |

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| | | some evaluation of literature; however all MS students begin their coursework in CHEM510, where students and advisors are expected to develop a thesis plan associated with the research expected from the student. Additionally, in CHEM593 (seminar) and CHEM589 (thesis defense), students are required to demonstrate significant knowledge of scientific literature. For students who take the intership option, | CHEM531 (4 students), CHEM578(4 students), CHEM589(3 students), CHEM592(1 student), CHEM593(2 students), and CHEM599(3 students). Also, all students have had at least one committee meeting this past year. | committee meetings – which shows that the student is making the necessary progress toward graduation. All students should receive an A in the thesis defense – showing mastery of their area of study and research. Realistically, some student perform poorly in classwork – many students not prepared for depth, breadthe, and scope of courses and/or | | | |

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| | | CHEM588 is the intership defense. Also, students are evaluated during research credits, CHEM599 and CHEM592 during meetings with their advisor and group meetings. | | research. Students must maintain a 3.0 GPA to remain in good standing in the program. | | | |
| 2: Chemistry MS students will be able to effectively communicate scientific research, both their own and information from the research literature, in written and oral fashions. | Spring 2017 by Richard Farrer. | See SLO 1. Coursework, research, and committee meetings are used to guide and direct the student toward mastery in this area, and also for purposed of evaluating the students' growth and abilities in these areas. Additionally, individual research group meetings often | CHEM502(3 students), CHEM510(2 students), CHEM511(0 students), CHEM519(1 student), CHEM519L(1 student), CHEM529(5 students), CHEM531 (4 students), CHEM578(4 students), CHEM589(3 students), CHEM592(1 student), | Formal evaluations occur during courses, committee meetings and thesis defenses. Non-formal evaluations occur in regular group meetings, meetings with advisors, and in everyday laboratory | All students have shown adequate growth and are satisfactorily progressing towards graduation. | Students progressing to thesis defense. | None. |

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| | | require students to discuss their research with the faculty mentor and other group members – such discussions often lead to analysis of data via the scientific method and through critical thinking. Thus, some of the best areas for growth of the students occurs in non-formal, non-graded settings. Honestly, these are the important times the student needs to succeed – since employment will be more | CHEM593(2 students), and CHEM599(3 students). Also, all students have had at least one committee meeting this past year. | interactions. | | | |

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| | | similar to these occasions than courses. | | | | | |
| 3: Chemistry MS students will develop and master the scientific problem solving skills required to define and solve basic or applied original scientific questions using the scientific method | Spring 2017 by Richard Farrer. | See SLO 2. | CHEM502(3 students), CHEM510(2 students), CHEM511(0 students), CHEM519(1 student), CHEM519L(1 student), CHEM529(5 students), CHEM531 (4 students), CHEM578(4 students), CHEM589(3 students), CHEM592(1 student), CHEM593(2 students), and CHEM599(3 students). Also, all students have had at least one committee meeting this | Again, all students should complete each course with an A or B, and students should have positive reviews after each committee meeting. However, the committee meetings are also to assist misdirected students back to a path toward graduation. At the time the students choose to defend their thesis/internship, the | All students showing progress towards mastery of this material. | All students are currently on the thesis plan (as opposed to the internship route). The thesis plan requires students to do novel research and report their findings minimally in a thesis (but many students present work at meetings or publish their findings in peer-reviewed journals). In order to complete a thesis, significant research must be completed – and this research must follow the scientific method. Thus, students are well trained in experimental techniques, experimental design, and | None. |

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| | | | past year. | student must be at or very near mastery of their material, and have a firm grasp on the scientific method and how to apply it to experimental design, data analysis, and production of results. | | scientific problem solving. | |
| 4: Chemistry MS students will actively engage in collaborative research or internships and discourse with the faculty in the Chemistry Department and other STEM disciplines as appropriate. | Spring 2017 by Richard Farrer. | CHEM592 and CHEM599 – research, CHEM598 – intership. Final assessment at thesis defense (CHEM589) or intership defense (CHEM588). | CHEM589(3 students), CHEM592(1 student), CHEM599(3 students). | Students graded on CHEM599 – thesis research and CHEM588/ 589 defenses. All other internship/ research is pass/fail. All students should be receiving | All students are actively participating in research. | Students enrolled in research must actively engage in scientific research. No students on internship plan. | None. |

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| | | | | either an A or B in thesis research, and all students should be receiving satisfactory grades in S/U coursework. Students should receive A's for defenses. | | | |
| 5: Chemistry MS students and faculty will disseminate the prodcts of the Chemistry MS program within the CSU-Pueblo community and communities outside the university in activities using their professional expertise | Spring 2017 by Richard Farrer. | CHEM588, CHEM589, CHEM593, CSU-Pueblo symposia, and regional and national scientific meetings. Also, publication of material in scientific journals. | CHEM589 (3 students) and CHEM593 (2 students). Graduate students presented their research at the CSU-P Student Research Symposium that was held Spring 2018 – four students presented | Students are expected to receive A's for their thesis defenses. For symposia, students are expected to know the material and confidently discuss their experiments and results. This is typically the | The symposium presentations were excellent – students were well prepared and able to provide insights into their research and results. | Students progressing toward graduation. | None. |

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| | | | research as this symposium. Graduate students also presented at the national American Chemical Society held in New Orleans. | case, since faculty ensure that the material is prepared well, and the student is also prepared. Faculty spend many hourse working with students in preparation of presentations. | | | |

During the 2017-2018 academic year, it appears as if two students will complete an MS degree in Chemistry – assuming the corrected theses are turned in by June 15th. We should see an additional two or three students graduate next year. At least one student will be entering the program in the Fall 2018 term.

**II. Follow-up (closing the loop) on results and activities from previous assessment cycles. In this section, please describe actions taken during this cycle that were based on, or implemented to address, the results of assessment from previous cycles.**

| A. What SLO(s) did you address? Please include the outcome(s) verbatim from the assessment | B. When was this SLO last assessed? Please indicate the semester and year. | C. What were the recommendations for change from the previous assessment? | D. Were the recommendations for change acted upon? If not, why? | E. What were the results of the changes? If the changes were not effective, what are the next steps or the new recommendations? |
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| plan. | | | | |
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This assessment is based on four students that were enrolled in coursework as part of the Chemistry MS program. Because the assessment is based on such a small population, no significant changes will be made to the program unless a significant issue was found. Historically, students that successfully complete their MS degrees have faired well in the job market. The assessment plan for the Chemistry and Biochemistry MS will undergo its own assessment as time allows.

Please find attached the evaluation employed for student committee meetings.