

Program: \_\_\_Biochemistry, M.S.\_\_\_\_\_

Date: \_\_\_July 7, 2020\_\_\_\_\_

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? <b>Please include the outcome(s) verbatim from the assessment plan.</b>	B. When was this SLO last assessed? <b>Please indicate the semester and year.</b>	C. What method was used for assessing the SLO? <b>Please include a copy of any rubrics used in the assessment process.</b>	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 <u>program</u> are planned based on this assessment?
1: Biochemistry MS students will be able to evaluate the scientific literature and to use it in their courses and research.	Spring 2019 by Richard Farrer.	This SLO is assessed through both performance in coursework and performance during thesis committee meetingsAll 500 level courses involve some	CHEM502(0 students), CHEM510(0 students), CHEM511(0 students), CHEM512 (1 student), CHEM512L (0 student), CHEM519(0 students), CHEM519L(0	All students should receive a grade of A or B in all graded courses. All students should have positive reviews from committee	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.

		<p>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 internship option, CHEM588 is the internship defense. Also,</p>	<p>students), CHEM529(0 students), CHEM531 (1 student), CHEM578(0 students), CHEM589(0 students), CHEM592(0 students), CHEM593(1 student), CHEM595 (0 students), and CHEM599(1 student). Also, all students have had at least one committee meeting this past year.</p>	<p>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, breadth, and scope of courses and/or research. Students must</p>			
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		students are evaluated during research credits, CHEM599 and CHEM592 during meetings with their advisor and group meetings.		maintain a 3.0 GPA to remain in good standing in the program.			
2: Biochemistry 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 2019 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 require students to discuss their research with the faculty	CHEM502(0 students), CHEM510(0 students), CHEM511(0 students), CHEM512 (1 student), CHEM512L (0 student), CHEM519(0 students), CHEM519L(0 students), CHEM529(0 students), CHEM531 (1 student), CHEM578(0 students), CHEM589(0 students), CHEM592(0 students), CHEM593(1	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 interactions.	All students have shown adequate growth and are satisfactorily progressing towards graduation.	Students progressing to thesis defense.	None.

		<p>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 similar to these occasions than courses.</p>	<p>student), CHEM595 (0 students), and CHEM599(1 student). Also, all students have had at least one committee meeting this past year.</p>				
<p>3: Biochemistry MS students will develop and master the</p>	<p>Spring 2019 by Richard Farrer.</p>	<p>See SLO 2.</p>	<p>CHEM502(0 students), CHEM510(0 students),</p>	<p>Again, all students should complete</p>	<p>All students showing progress towards</p>	<p>All students are currently on the thesis plan (as opposed to the</p>	<p>None.</p>

<p>scientific problem solving skills required to define and solve basic or applied original scientific questions using the scientific method</p>			<p>CHEM511(0 students),  CHEM512 (1 student),  CHEM512L (0 student),  CHEM519(0 students),  CHEM519L(0 students),  CHEM529(0 students),  CHEM531 (1 student),  CHEM578(0 students),  CHEM589(0 students),  CHEM592(0 students),  CHEM593(1 student),  CHEM595 (0 students),  and  CHEM599(1 student).  Also, all students have had at least one committee meeting this past year.</p>	<p>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/intership, the student must be at or very near mastery of their material, and have a firm grasp on the</p>	<p>mastery of this material.</p>	<p>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 scientific problem solving.</p>	
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				scientific method and how to apply it to experimental design, data analysis, and production of results.			
4: Biochemistry 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 2019 by Richard Farrer.	CHEM592 and CHEM599 – research, CHEM598 – internship. Final assessment at thesis defense (CHEM589) or internship defense (CHEM588).	CHEM589 (0 students), CHEM592 (0 students), CHEM599 (1 student).	Students graded on CHEM599 – thesis research and CHEM588/589 defenses. All other internship/research is pass/fail. All students should be receiving either an A or B in thesis research, and all students should be receiving satisfactory grades in S/U coursework.	All students are actively participating in research.	Students enrolled in research must actively engage in scientific research. No students on internship plan.	None.

				Students should receive A's for defenses.			
5: Biochemistry MS students and faculty will disseminate the products of the Chemistry MS program within the CSU-Pueblo community and communities outside the university in activities using their professional expertise	Spring 2019 by Richard Farrer.	CHEM588, CHEM589, CHEM593, CSU-Pueblo symposia, and regional and national scientific meetings. Also, publication of material in scientific journals.	CHEM589 (0 students) and CHEM593 (1 student). Graduate students presented research at regional and national meetings. Unfortunately, the CSU-Pueblo symposium was canceled.	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 case, since faculty ensure that the material is prepared well, and the student is also prepared. Faculty spend many hours working	The symposium presentations were excellent – students were well prepared and able to provide insights into their research and results.	Students progressing toward graduation.	None.

				with students in preparation of presentations.			
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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 15<sup>th</sup>. 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 plan.	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?

There are currently two active students in the Biochemistry MS program. Both are scheduled for graduation by December 2020; however, limited/no access to laboratory facilities in order to complete thesis research may delay one of the graduations. The other issue is the lack of incoming students into the MS Chemistry program. However, Dr. Sandra Bonetti, the only biochemist in the Chemistry Department retired at the end of the 2019 – 2020 academic year, and there is little chance of hiring another biochemist in the near future. A number of reasons exist for the lack of students, but the main issue is the cost and the lack of financial aid that we provide for our students. We have had discussions on programs that could benefit the program (chemical education, cannabis, online, non-thesis, etc.) and are continuing to assess the best way to move forward to ensure the program is sustainable and that we can keep a consistent population of students.