Colorado State University – Pueblo Academic Program Assessment Report for AY 2019-2020

Due: June 1, 2020

 Program:
 Chemistry, M.S.
 Date:
 July 7, 2020

Completed by: Richard Farrer

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

A. Which of the	B. When	C. What	D. Who was	E. What is	F. What	G. What were the	H. What
program SLOs	was this	method was	assessed?	the	were the	department's	changes/improvements
were assessed	SLO last	used for	Please fully	expected	results of the	conclusions about	to the <u>program</u> are
during this	assessed?	assessing the	describe the	achievement	assessment?	student	planned based on this
cycle? Please	Please	SLO? Please	student	level and		performance?	assessment?
include the	indicate	include a copy	group(s) and	how many			
outcome(s)	the	of any rubrics	the number	or what			
verbatim from	semester	used in the	of students	proportion			
the assessment	and year.	assessment	or artifacts	of students			
plan.		process.	involved.	should be at			
				it?			
1: Chemistry	Spring	This SLO is	CHEM502(0	All students	All students	All students	None.
MS students	2019 by	assessed	students),	should	progressing	progressing toward	
will be able to	Richard	through both	CHEM510(0	receive a	toward	completion of	
evaluate the	Farrer.	performance in	students),	grade of A	thesis	degree.	
scientific		coursework	CHEM511(0	or B in all	defense and		
literature and		and	students),	graded	graduation.		
to use it in their		performance	CHEM512 (0	courses. All	No student		
courses and		during thesis	students),	students	is currently		
research.		committee	CHEM512L (0	should have	below the		
		meetingsAll	student),	positive	3.0 GPA		
		500 level	CHEM519(0	reviews	requirement		
		courses involve	students),	from			
		some	CHEM519L(0	committee			

 		. I		
evaluation of	students),	meetings –		
literature;	CHEM529(0	which shows		
however all MS	students),	that the		
students begin	CHEM531 (2	student is		
their	students),	making the		
coursework in	CHEM578(2	necessary		
CHEM510,	students),	progress		
where students	CHEM589(2	toward		
and advisors	students),	graduation.		
are expected to	CHEM592(0	All students		
develop a	students),	should		
thesis plan	CHEM593(4	receive an A		
associated with	students),	in the thesis		
the research	CHEM595 (2	defense –		
expected from	students),	showing		
the student.	and	mastery of		
Additionally, in	CHEM599(4	their area of		
CHEM593	students).	study and		
(seminar) and	Also, all	research.		
CHEM589	students	Realistically,		
(thesis	have had at	some		
defense),	least one	student		
students are	committee	perform		
required to	meeting this	poorly in		
demonstrate	past year.	classwork –		
significant		many		
knowledge of		students not		
scientific		prepared for		
literature. For		depth,		
students who		breadthe,		
take the		and scope of		
intership		courses		
option,		and/or		
CHEM588 is		research.		
the intership		Students		
defense. Also,		must		

		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: 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 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 (0 students), CHEM512L (0 student), CHEM519(0 students), CHEM519L(0 students), CHEM529(0 students), CHEM531 (2 students), CHEM578(2 students), CHEM578(2 students), CHEM578(2 students), CHEM592(0 students), CHEM592(0 students), CHEM592(0 students), CHEM593(4	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.

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		mentor and	students),				
		other group	CHEM595 (2				
		members –	students),				
		such	and				
		discussions	CHEM599(4				
		often lead to	students).				
		analysis of data	Also, all				
		via the	students				
		scientific	have had at				
		method and	least one				
		through critical	committee				
		thinking. Thus,	meeting this				
		some of the	past year.				
		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.					
3: Chemistry	Spring	See SLO 2.	CHEM502(0	Again, all	All students	All students are	None.
MS students	2019 by		students),	students	showing	currently on the	
will develop	Richard		CHEM510(0	should	progress	thesis plan (as	
and master the	Farrer.		students),	complete	towards	opposed to the	
	i un ch	L	students),	complete	towards	opposed to the	

scientific	CHEM511(0	each course	mastery of	internship route).	
problem	students),	with an A or	this material.	The thesis plan	
			this material.	-	
solving skills	CHEM512 (0	B, and		requires students	
required to	students),	students		to do novel	
define and	CHEM512L (0	should have		research and	
solve basic or	student),	positive		report their	
applied original	CHEM519(0	reviews		findings minimally	
scientific	students),	after each		in a thesis (but	
questions using	CHEM519L(0	committee		many students	
the scientific	students),	meeting.		present work at	
method	CHEM529(0	However,		meetings or	
	students),	the		publish their	
	CHEM531 (2	committee		findings in peer-	
	students),	meetings		reviewed journals).	
	CHEM578(2	are also to		In order to	
	students),	assist		complete a thesis,	
	CHEM589(2	misdirected		significant research	
	students),	students		must be completed	
	CHEM592(0	back to a		– and this research	
	students),	path toward		must follow the	
	CHEM593(4	graduation.		scientific method.	
	students),	At the time		Thus, students are	
	CHEM595 (2	the students		well trained in	
	students),	choose to		experimental	
	and	defend their		techniques,	
	CHEM599(4	thesis/inters		experimental	
	students).	hip, the		design, and	
	Also, all	student		scientific problem	
	students	must be at		solving.	
	have had at	or very near		Solving.	
	least one	mastery of			
	committee	their			
	meeting this	material,			
	past year.	and have a			
		firm grasp			
		on the			

A: Chemistry MS students collaborative the Chemistry mil actively engage in collaborative the Chemistry defense collaborative the Students intership defense collaborative the Students mitership defense collaborative the Students mitership defense collaborative the Students mitership defense collaborative the Students mitership defense collaborative the Students mitership defense collaborative mitership defense collaborative mitership defense should be receiving satisfactory grades in should be satisfactory grades in should be satisfactory grades in should be satisfactory grades in satisfactory grades in satisfactory grades in					scientific			
4: Chemistry MS studentsSpring CHEM592 and CHEM599 - research, and thership/ Final assessment at the Chemistry Collaborative research or the Chemistry Department and thership/ Final STEM disciplines as appropriate.CHEM592 and CHEM592 and CHEM599 - CHEM599 - CHEM598 - CHEM599 - CHEM598 - CHEM599 - CHEM598 - CHEM588/ CH								
4: Chemistry data analysis, and production of results.Students are actively participating in research are actively ender intership and data are actively ender ender (CHEM592)CHEM592 and CHEM592 and chem53, collaborative the chemistry Department and other STEM disciplines as appropriate.Subants chem53, final chem53, final chem54,								
4: Chemistry MS studentsSpring CHEMS92 and CHEMS99 - CHEMS99 - CHEMS90 - CHEMS9								
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4: Chemistry MS students collaborative research or intership and discourse with the faculty in the fac								
4: Chemistry Mistudents Renard engage in collaborative research or the faculty in the Chemistry discipring and other STEM disciprinate.CHEM592 and CHEM599 - research, antership. Final assessment at thesis defense (CHEM589) - (CHEM589) - CHEM599 (A CHEM599 (A CHEM588/ CHEM598 (CHEM588) CHEM588/ CHEM588 (CHEM588) CHEM588 (CHEM588) CHEM588 (CHEM588) CHEM588 (CHEM588) CHEM588 (CHEM588).All students chense CHEM588 (CHEM588). CHEM588 (CHEM588).None.and other STEM disciplines as appropriate.CHEM588 (CHEM588). (CHEM588).CHEM588 (CHEM588). CHEM588 (CHEM588).CHEM588 (CHEM588). CHEM588 (CHEM588).All other intership defense. All other intershipStudents should be receiving either an A or B in thesis research, and all students should be receiving grades in S/UStudents should be receiving satisfactory grades in S/UStudents should be receiving students S/U </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
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LetterKernelKernelKernelKernelKernelKernel4: Chemistry MS students will actively engage in research or internships and discourse with the Chemistry Department and other STEMCHEM592 and CHEM592 by CHEM592 by CHEM598 by collaborative research or internship stand discourse with the Chemistry Department and other STEM defense CHEM588).CHEM588 CHEM588).Students students).Students chem59 defense. 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/UCHEM580 by chem59 chem580 by chem580 by <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
4: Chemistry MS students Spring 2019 by will actively engage in collaborative research or internships and discourse with the faculty in the Chemistry Department and other STEM disciplines as appropriate. CHEM592 and CHEM592 - internships final assessment at thesis defense (CHEM588) or internship defense (CHEM588). Students graded on CHEM599 - Students), CHEM599 (4 students). All students are actively participating in research. Students, Stud					•			
MS students will actively engage in collaborative research or internships and discourse with the Chemistry Department assessment at students,students, cHEM599 (4 students), CHEM599 (4 students), CHEM599 (4 students), CHEM588/ S89 defenses. All other pass/fail. All students should be receiving either an A or B in thesis research, appropriate.are actively are actively participating in research. No students on internship plan.MS students collaborative research or internships and discourse with the Chemistry Department and other STEM disciplines as appropriate.CHEM588).CHEM588). S89 defense (CHEM588).are actively pass/fail. All students should be receiving either an A or B in thesis research, should be receiving either an A or B in thesis research should be receiving either an A or B in thesis researchin research must actively engage in scientific research. No students should be receiving either an A or B in thesis research should be receiving satisfactory grades in S/Uin esearch must actively engage in scientific research. No students should be receiving satisfactory grades in S/U	1. Chemistry	Spring	CHEM592 and	CHEM589 (2		All students	Students enrolled	None
will actively engage in collaborativeRichard Farrer.research, CHEM598 - intership. FinalCHEM592 (0 students), CHEM599 (4 thesisParticipating in research and scientific research.actively engage in scientific research.research or internships and discourse with the Chemistry Department and other STEM disciplines as appropriate.Richard Farrer.research and students.Participating in research and students.actively engage in scientific research.Will actively research or internships and discourse with the Chemistry Department and other STEM disciplines as appropriate.Richard the Sale.CHEM588).Participating in research and students.actively engage in scientific research.No students begartment disciplines as appropriate.Richard (CHEM588).CHEM588).Sale the scientific research is pass/fail. All students should be receiving either an A or B in thesis research, and all students should be receiving grades in S/Uactively engage in scientific research.No students should be receiving grades in S/URichard the scientific research.Richard the scientific research.Will actively enderseRichard the scientific research.Richard the scientific research.Students should be receiving grades in S/URichard the scientific research.Richard the scientific research.Students should be receiving satisfactory grades in S/URichard the scientific research.Richard the scientific research.		• •		-				None.
engage in collaborative research or intership. and discourse with the faculty in the Chemistry Department and other STEM disciplines as appropriate.CHEM598 - intership. Final assessment at thesis defense (CHEM589) or intership.students).thesis research and CHEM588/ S89 defenses and other studentsscientific research. No students on internship/ research is pass/fail. All studentsSTEM disciplines as appropriate.(CHEM588).Image: students and other STEM disciplines as appropriate.(CHEM588).Image: students and all students should be receiving either an A or B in thesis research, and all students should be receiving either an A or B in thesis research, and all students should be receiving either an A or B in thesis research, and all students should be receiving satisfactory grades in S/Uimage: students should be receiving satisfactory grades in S/Uimage: students should be receiving satisfactory 					-			
collaborative research or internships and discourse with the faculty in the faculty in 				-		–		
research or internships and discourse with the faculty in the Chemistry Department and other STEM disciplines as appropriate. Her State of the state of		Turrer.				in research.		
internships and discourse with the faculty in the faculty in the Chemistry Department and other STEM disciplines as appropriate.				-				
discourse with the faculty in the faculty in the Chemistry Department and other STEM disciplines as appropriate.				students).	-			
the faculty in intership defense internship/ Department (CHEM588). research is pass/fail. All STEM disciplines as appropriate. either an A or B in thesis research, and all students should be receiving either an A or B in thesis research, and all students should be receiving satisfactory grades in S/U	•							
the Chemistry Department (CHEM588). 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								
Department and other STEM disciplines as appropriate. (CHEM588). (
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or B in thesis research, and all students should be receiving satisfactory grades in S/U	appropriater				•			
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satisfactory grades in S/U								
grades in S/U					-			
S/U								
					-			
					coursework.			

				Students			
				should			
				receive A's			
				for			
				defenses.			
5: Chemistry	Spring	CHEM588,	CHEM589 (2	Students are	The	Students	None.
MS students	2019 by	CHEM589,	students)	expected to	symposium	progressing toward	
and faculty will	Richard	CHEM593,	and	receive A's	presentation	graduation.	
disseminate	Farrer.	CSU-Pueblo	CHEM593 (4	for their	s were		
the prodcts of		symposia, and	students).	thesis	excellent –		
the Chemistry		regional and	Graduate	defenses.	students		
MS program		national	students	For	were well		
within the CSU-		scientific	presented	symposia,	prepared		
Pueblo		meetings.	research at	students are	and able to		
community and		Also,	regional and	expected to	provide		
communities		publication of	national	know the	insights into		
outside the		material in	meetings.	material and	their		
university in		scientific	Unfortunatel	confidently	research and		
activities using		journals.	y, the CSU-	discuss their	results.		
their			Pueblo	experiments			
professional			symposium	and results.			
expertise			was	This is			
			canceled.	typically the			
				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		
		presentation		
		S.		

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)	B. When was this	C. What were the	D. Were the	E. What were the results of the
did you address?	SLO last assessed?	recommendations for change	recommendations for	changes? If the changes were not
Please include	Please indicate the	from the previous	change acted upon? If not,	effective, what are the next steps or
the outcome(s)	semester and year.	assessment?	why?	the new recommendations?
verbatim from				
the assessment				
plan.				

There are currently five active students in the Chemistry MS program. All are scheduled for graduation by December 2020; however, limited/no access to laboratory facilities in order to complete thesis research may delay some graduations. The other issue is the lack of incoming students into the MS Chemistry program. 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.