Colorado State University – Pueblo Academic Program Assessment Report for AY 2016-2017

Due: June 1, 2017

Program:____Chemistry, M.S._____

Date: __July 28, 2017_____

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	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	CHEM510(2	All students	Most	All students	None.
MS students	2016 by	assessed	students),	should	students	progressing toward	
will be able to	Richard	through both	CHEM592(0	receive a	progressing	completion of	
evaluate the	Farrer.	performance in	student),	grade of A	toward	degree.	
scientific		coursework	CHEM593(2	or B in all	thesis		
literature and		and	students),	graded	defense and		
to use it in their		performance	CHEM589(1	courses. All	graduation.		
courses and		during thesis	students),	students	No student		
research.		committee	CHEM599(3	should have	is currently		
		meetingsAll	students),	positive	below the		
		500 level	CHEM501(2	reviews	3.0 GPA		
		courses involve	students),	from	requirement		

someCHEM512(2committee.evaluation ofstudents),meetings -literature;CHEM513 (1)which showshowever all MSstudent),that thestudents beginCHEM519L(1)student istheirstudent),making thecoursework inCHEM525(2)necessaryCHEM510,students),graduation.and advisorsstudents,graduation.and advisorsstudentsAll student.are expected toAlso, allAll student.their searchcommitteedefensecexpect of first showingmastery ofthesis planhave had atthe student.past year.associated withleast onethe student.past year.past year.mastery ofcHEM539student(seminar) andstudentgenerational, isstudentthe student.past year.past year.studentchemspanstudentchemspanstudentpast year.mastery oftheir area ofstudentchemspanstudentgenerational, issomegenerational, issomegenerational, issomegenerational, issomegenerational, issomegenerational, issomegenerational, issomegenerational, issomegenerational, issomegenerational, issome <t< th=""><th></th><th></th><th></th><th></th><th></th></t<>					
literature; however all MS students beginCHEM513 (1 student), making the rcoursework in CHEM519L(1 theirwhich shows student), making the progress toward graduation.Cursework in CHEM510, where studentsCHEM52(2 students), progress studentsnaking the progress graduation.Where students develop a thesis plan the student the research expected from the student.All students should receive an A in the thesis defense – study and research.CHEM593 (seminar) and CHEM593 (thesis defense), students areShould research.CHEM593 (seminar) and CHEM593 (thesis defense, students areShould research.CHEM593 (thesis defense, student arestudent showing mastery of student should research.CHEM593 (thesis defense, student areShould research.CHEM593 (seminar) and CHEM593 (student areRealistically, some studentCHEM589 (thesis defense, student areSome studentCHEM593 (seminar) and CHEM593Some studentCHEM589 (thesis defense), student areSome studentCHEM589 (thesis defense), student areSome studentCHEM593 (thesis defense), student areSome student					
however all MS students beginstudent), CHEM519L(1that the student isstudents beginCHEM519L(1student istheirstudent), coursework inCHEM525(2coursework inCHEM525(2necessaryCHEM510, where studentsstudents), students), and advisorsprogressand advisorsstudents, students, are expected toAlso, all All studentsdevelop astudents shouldshouldthesis planhave had at least onereceive an A in the thesisexpected from expected from the student.meeting this showingshowingthest student. (seminar) and (seminar) and (seminar) and (seminar) and students arestudent student student student past year.KelmS89 (thesis defense), students arestudent performstudent perform			-		
students begin theirCHEM519L(1 student),student is making the coursework in CHEM510,student),making the necessary graduation.CHEM510,students),progress students),progressand advisorsstudents),graduation.are expected to develop aAlso, allAll studentsthesis planhave had at least onereceive an Aassociated with the researchleast onein thesis graduation.the student.past year.mastery ofAdditionally, in CHEM593 (seminar) and CHEM589 (thesisstudent graduation.CHEM593 (seminar) and CHEM589 (thesisstudent someGefense), students aresomedefense, students aresomedefense, performstudent studentdefense),student students aredefense),student studentdefense),student studentdefense),student studentdefense),student student					
theirstudent),making the necessarycoursework inCHEM525(2necessaryCHEM510,students),progresswhere studentsCHEM591 (2towardand advisorsstudents).graduation.are expected toAlso, allAll studentsdevelop astudentsshouldthesis planhave had atreceive an Aassociated withleast onein the thesisthe researchcommitteedefense –expected frommeeting thisshowingthe student.past year.mastery ofAdditionally, incHEM593study and(Seminar) andcsearch.chealistically,(thesisissomestudentdefense),studentsomedefense),studentperform	however all MS	student),	that the		
coursework in CHEM510,CHEM52(2) students),necessary progresswhere students and advisorsCHEM591 (2) students).toward graduation.are expected to develop aAlso, all studentsAll students shouldthesis plan the researchhave had at committeereceive an A defense –expected from the student.meeting this showingshowingthe student. committeepast year.mastery of study and (seminar) and CHEM593CHEM593 (seminar) and CHEM589 (thesisstudent somestudy and study and study and student past year.CHEM589 (thesiscommitteestudent preserch.CHEM589 (thesiscommet performstudent perform	students begin	CHEM519L(1	student is		
CHEM510, where students and advisorsstudents), CHEM591 (2progress towardand advisors are expected to develop aAlso, all studentsAll studentsare expected to develop aAlso, all studentsAll studentsassociated with the research expected from the studenthave had at in the thesisreceive an A effense –expected from expected from the studentmeeting this showingshowingthe research committeecommittee defense –expected from the studentpast year. study and(seminar) and (seminar) and (semise), thesisstudent somechemse), students arestudent perform	their	student),	making the		
where studentsCHEM591 (2towardand advisorsstudents).graduation.are expected toAlso, allAll studentsdevelop astudentsshouldthesis planhave had atreceive an Aassociated withleast onein the thesisthe researchcommitteedefense –expected frommeeting thisshowingthe student.past year.mastery ofAdditionally, incheir area ofstudy and(seminar) andresearch.comeCHEM589kealistically,some(thesisstudentpart year.befores,studentperform	coursework in	CHEM525(2	necessary		
and advisorsstudents).graduation.are expected toAlso, allAll studentsdevelop astudentsshouldthesis planhave had atreceive an Aassociated withleast onein the thesisthe researchcommitteedefense –expected frommeeting thisshowingthe student.past year.mastery ofAdditionally, intheir area ofCHEM593study and(seminar) andresearch.CHEM589Realistically,(thesissomedefense,studentpatudents arestudentperformstudent	CHEM510,	students),	progress		
are expected to develop aAlso, allAll students shoulddevelop astudentsshouldthesis planhave had atreceive an Aassociated withleast onein the thesisthe researchcommitteedefense –expected frommeeting thisshowingthe student.past year.mastery ofAdditionally, intheir area ofCHEM593study and(seminar) andresearch.CHEM589Realistically,(thesissomedefense),studentstudents areperform	where students	CHEM591 (2	toward		
develop astudentsshouldthesis planhave had atreceive an Aassociated withleast onein the thesisthe researchcommitteedefense -expected frommeeting thisshowingthe student.past year.mastery ofAdditionally, intheir area ofCHEM593study and(seminar) andresearch.CHEM589Realistically,(thesissomedefense),studentstudents areperform	and advisors	students).	graduation.		
thesis plan associated with the research expected from the student.have had at least one ommitteereceive an A in the thesis defense –expected from the student.meeting this past year.showing mastery of their area of study and research.CHEM593 (seminar) and CHEM589 (thesis defense), students arestudent past year.meeting this some student perform	are expected to	Also, all	All students		
associated with the researchleast onein the thesisthe researchcommitteedefense -expected from the student.meeting thisshowingthe student.past year.mastery ofAdditionally, in CHEM593their area of(seminar) and CHEM589study and(thesisneeting this somedefense), students aresomejudents arejudent perform	develop a	students	should		
the research expected from the student. Additionally, in CHEM593 (seminar) and CHEM589 (thesiscommittee meeting this past year. their area of study and research. Realistically, some student student performdefense hCHEM589 (thesis defense), students areedfense performstudent perform	thesis plan	have had at	receive an A		
expected from the student.meeting this past year.showing mastery of their area of study and research.CHEM5936study and research.CHEM589Realistically, some defense), students aresome student	associated with	least one	in the thesis		
the student.past year.mastery ofAdditionally, intheir area ofCHEM593study and(seminar) andresearch.CHEM589Realistically,(thesissomedefense),studentstudents areperform	the research	committee	defense –		
Additionally, intheir area of study andCHEM593study and(seminar) andresearch.CHEM589Realistically,(thesissomedefense),studentstudents areperform	expected from	meeting this	showing		
CHEM593study and(seminar) andresearch.CHEM589Realistically,(thesissomedefense),studentstudents areperform	the student.	past year.	mastery of		
(seminar) andresearch.CHEM589Realistically,(thesissomedefense),studentstudents areperform	Additionally, in		their area of		
CHEM589 Realistically, (thesis some defense), student students are perform	CHEM593		study and		
(thesis some defense), student students are perform	(seminar) and		research.		
defense), student students are perform	CHEM589		Realistically,		
students are perform	(thesis		some		
	defense),		student		
required to poorly in	students are		perform		
	required to		poorly in		
demonstrate classwork –	demonstrate		classwork –		
significant many	significant		many		
knowledge of students not	knowledge of		students not		
scientific prepared for	scientific		prepared for		
literature. For depth,	literature. For		depth,		
students who breadthe,	students who		breadthe,		
take the and scope of	take the				
intership courses	intership				
option, and/or	option,		and/or		

		CHEM588 is the intership defense. Also, students are evaluated during research credits, CHEM599 and CHEM592 during		research. Students must maintain a 3.0 GPA to remain in good standing in the			
		meetings with their advisor and group meetings.		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 2016 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	CHEM510(2 students), CHEM592(0 student), CHEM593(2 students), CHEM589(1 students), CHEM599(3 students), CHEM501(2 students), CHEM512(2 students), CHEM513 (1 student), CHEM519L(1 student), CHEM525(2 students),	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.	Several students nearing thesis defense.	None.

requ		M591 (2	interactions.		
		ents).			
	uss their Also,				
	earch with stude				
	,	e had at			
mer	ntor and least	: one			
othe	er group com	mittee			
mer	mbers – mee	ting this			
such	n past	year.			
disc	ussions				
ofte	en lead to				
anal	lysis of data				
via t	the				
scie	ntific				
met	hod and				
thro	ough critical				
thin	king. Thus,				
	ne of the				
best	t areas for				
grov	wth of the				
stud	lents				
οςςι	urs in non-				
forn	nal, non-				
grad					
sett	ings.				
	estly, these				
are	-				
imp	ortant				
	es the				
stud	lent needs				
	ucceed –				
sinc					
emp	ployment				
	be more				

		similar to these					
		occasions than					
		courses.					
3: Chemistry	Spring	See SLO 2.	CHEM510(2	Again, all	All students	All students are	None.
, MS students	2016 by		students),	students	showing	currently on the	
will develop	Richard		CHEM592(0	should	progress	, thesis plan (as	
and master the	Farrer.		student),	complete	towards	opposed to the	
scientific			CHEM593(2	each course	mastery of	internship route).	
problem			students),	with an A or	this material.	The thesis plan	
solving skills			CHEM589(1	B, and		requires students	
required to			students),	students		to do novel	
define and			CHEM599(3	should have		research and	
solve basic or			students),	positive		report their	
applied original			CHEM501(2	reviews		findings minimally	
scientific			students),	after each		in a thesis (but	
questions using			CHEM512(2	committee		many students	
the scientific			students),	meeting.		present work at	
method			CHEM513 (1	However,		meetings or	
			student),	the		publish their	
			CHEM519L(1	committee		findings in peer-	
			student),	meetings		reviewed journals).	
			CHEM525(2	are also to		In order to	
			students),	assist		complete a thesis,	
			CHEM591 (2	misdirected		significant research	
			students).	students		must be completed	
			Also, all	back to a		 and this research 	
			students	path toward		must follow the	
			have had at	graduation.		scientific method.	
			least one	At the time		Thus, students are	
			committee	the students		well trained in	
			meeting this	choose to		experimental	
			past year.	defend their		techniques,	
				thesis/inters		experimental	
				hip, the		design, and	

				مغبيما مبدغ		antentifia sur la la su	
				student		scientific problem	
				must be at		solving.	
				or very near			
				mastery of			
				their			
				material,			
				and have a			
				firm grasp			
				on the			
				scientific			
				method and			
				how to			
				apply it to			
				experimenta			
				l design,			
				data			
				analysis, and			
				production			
				of results.			
4: Chemistry	Spring	CHEM592 and	CHEM592(0	Students	All students	Students enrolled	None.
MS students	2015 by	CHEM599 –	students),	graded on	are actively	in research must	
will actively	Richard	research,	CHEM599(3	CHEM599 –	participating	actively engage in	
engage in	Farrer.	CHEM598 –	students),	thesis	in research	scientific research.	
collaborative		intership. Final	CHEM589(1	research and	(except for	No students on	
research or		assessment at	students).	CHEM588/	Cheri	internship plan.	
internships and		thesis defense		589	Armstrong,		
discourse with		(CHEM589) or		defenses.	who is trying		
the faculty in		intership		All other	to work full		
the Chemistry		defense		internship/	time and		
Department		(CHEM588).		research is	complete		
and other				pass/fail. All	graduate		
STEM				students	research).		
disciplines as				should be	- ,		
appropriate.				receiving			
	1	1				1	

	r						
				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	Spring	CHEM588,	CHEM589 (1	Students are	The	Students	None.
MS students	2015 by	CHEM589,	students)	expected to	symposium	progressing toward	
and faculty will	Richard	СНЕМ593,	and	receive A's	presentation	graduation.	
disseminate	Farrer.	CSU-Pueblo	CHEM593 (2	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.	their	students are	and able to		
community and		Also,	research at	expected to	provide		
communities		publication of	the CSU-P	know the	insights into		
outside the		, material in	Student	material and	their		
university in		scientific	Research	confidently	research and		
-		journals.	Symposium	, discuss their	results.		
their			that was held				
professional				•			
•			four students	This is			
activities using their professional expertise		journals.	that was held Spring 2017 –	experiments and results.	results.		

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

During the 2016-2017 academic year, no students graduated with an MS degree in Chemistry. There are a couple of students that have completed the coursework and research and are in the process of writing theses. Additionally, three students were accepted into the program – all three have full-time employment, so they are seeking to extend their knowledge for advancement in their careers – one of these students has deferred his start for one year.

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.		

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.



Chemistry Department Master of Science in Chemistry Graduate Advisory Committee Meeting Progress Report

To be filed with the Program Director, student and Ad	lvisor. Check: Thesis	Internship	3+2
Student Name:	Date of n	neeting:	
Title:			

	Satisfactory	Satisfactory with deficiencies	Unsatisfactory
1. Graduate Advisor			
2. <u>Committee Member 1</u>			
3. <u>Committee Member 2</u>			

Each committee member signs and checks the appropriate box indicating the overall evaluation. The thesis advisor summarizes the major outcomes of the meeting below, discusses it with the student, and the students signs at the bottom.

Familiarity with Background Literature:

Experimental Design:

Communication of Project Design and Progress:

Progress Summary:

Action Plan for Next Semester:

Student signature

Date