#### Chemistry

### **Annual Program Report Template**

Year:	2022-2023
Program:	BA/BS in Chemistry & Forensic Chemistry
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#### **Summary of Continuous Improvement Efforts since Last Report**

Provide a brief description of how assessment results have been used for program improvement. Point to a specific example of how an assessment provided the program with data it could use for improvement and what that improvement was, if possible, also show evidence of the improvement. You may look at data from the two previous academic years to support this case.

# Respond here:

Our main goal is to provide students with skills required for them to succeed as working chemists. The learning outcomes involve demonstrating competency in oral communication skills, expertise in scientific writing and ability to effectively perform chemical research. Our assessments for each category have been used for program improvement all described in table 1. One specific example on how an assessment provided evidence for improvement is in research in which the data is above the benchmark expectations. It is important to note that there is a small number of students for research, and we will continue evaluating chemical research performance as well as oral communication skills and scientific writing.

## **Program Highlights Since Last Report**

Identify and briefly discuss any programmatic curriculum changes made since the last report (e.g. new courses, course changes, SLO changes, course deletions).

NA

Respond here:

Table 1. Assessment Results and Analyses for Current Cycle.

STAGE 1: PLAN				STAGE 2: DO		STAGE 3: STUDY
Departmental	Program Student	Assessment	Assessment	Benchmark	Data Results	Actions/Goals Based on Data
Student Learning	Learning Outcome		Method/Locati	Expectations		Results* What do the data tell
Goal			on			you? How will you use this
						data? How were data from the
						last cycle used to make changes
						during this cycle, and What
						were the results of those
						changes?
The goal is to	Undergraduate	Undergraduate	Undergraduate	80% of students	2021-2022	Comparing with the previous
provide students	Chemistry students will	students will	students will	will score an		evaluation year there is no
with the skills	demonstrate	make a formal	make a formal	average of	100% of	change however we plan to
required for them to	competency in oral	presentation at	presentation at	3.3/4.0 on the	students scored	increase the benchmark
succeed as working	communication skills.	the end of a	the end of a	rubric.	an average of	expectations in the next year.
chemists.		senior level	senior level		3.3/4.0 or	According to this year's results
		course. A	course. A		above.	from the rubric,
		committee of	committee of			comprehension was the
		reviewers will	reviewers will		2022-2023	weakest component. We will
		evaluate the	evaluate the			mainly focus on improving
		presentations	presentations		100% of	understanding/comprehension
		using the	using the		students scored	next year.
		following	following		an average of	
		assessment	assessment		3.3/4.0 or	
		rubric	rubric		above. The	
		developed by	developed by		average score	
		the chemistry	the chemistry		was 3.75/4.0	
		faculty	faculty			
		members. This	members. This			
		was chosen because these	was chosen because these			
		are skills in	are skills in			
		which our	which our			
		undergraduates	undergraduates			
		must exhibit	must exhibit			
		competency as	competency as			
		working	working			
		chemists.	chemists.			
		CHCHIIGG.	Chemists.			
		l		l		

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The goal is to	Undergraduate	In CHEM 4x71	In CHEM 4x71	80% of students	2021-2022	The assignments to evaluate
provide students	Chemistry students will	Introduction to	Introduction to	will score an		writing skills were more
with the skills	demonstrate expertise	Research, and	Research, and	average of 3.3 on	70% of the	focused on biochemistry topics
required for them to	in standard scientific	CHEM 4381	CHEM 4381	the rubric.	students scored	this year. The action plan is to
succeed as working	writing and the use of	Chemical	Chemical		an average of	have two tracks of topics to be
chemists.	English in preparing	Communication	Communication		3.3 or above.	covered, one with more focus
	reports.	s, Scientific	s, Scientific			on chemistry and the other one
		writing skills of	writing skills of		2022-2023	on biochemistry. We anticipate
		undergraduate	undergraduate			that this will impact the
		students will be	students will be		67% of the	average score and the
		evaluated by a	evaluated by a		students scored	percentage of students who
		committee of	committee of		an average of	score 3.3 and above will
		reviewers using	reviewers using		3.3 or above.	increase.
		an assessment	an assessment			
		rubric	rubric			According to this year's results
		developed by	developed by			from the rubric, we will mainly
		the chemistry	the chemistry			focus on improving the quality
		faculty	faculty			of information presented
		members.	members.			during the written assignments.
						Although the target was still
						not met, there was no
						significant change in student
						scores from 2021-2022 to the
						current 22-23 AY
The goal is to	Our students will be	Chemistry	Chemistry	80% of students	2021-2022	Comparing with the previous
provide students	able to effectively	majors in CHEM	majors in CHEM	will score an	100% of	evaluation year, our students
with the skills	perform chemical	4x71	4x71	average of	students scored	continued their excellent
required for them to	research at an	(Introduction to	(Introduction to	3.3/4.0 on the	an average of	performance, therefore we
succeed as working	introductory level.	Research	Research	rubric.	3.3/4.0 on the	plan to increase the benchmark
chemists.	,	courses where x	courses where		rubric.	expectations in the next year.
		= 2, 3, 4 credit	x = 2, 3, 4  credit		2022-2023	According to this year's results
		hours) are	hours) are			from the rubric the quality of
		trained to	trained to		100% of	data analysis was the weakest
		function as	function as		students scored	component. We will mainly
		professional	professional		an average of	focus on improving the quality
		chemists. A	chemists. A		3.3/4.0 on the	of data analysis next year.
		review	review		rubric. In 22-23	o. data analysis next year.
		committee will	committee will		the average	
		Committee will	Committee will		Life average	

evaluate a	evaluate a	score was
		3.8/4.0
representative section of final	representative	3.0/4.0
	section of final	
research	research	
presentations	presentations	
using the	using the	
following	following	
assessment	assessment	
rubric	rubric	
developed by	developed by	
the chemistry	the chemistry	
faculty	faculty	
members. This	members. This	
was chosen	was chosen	
because these	because these	
are skills in	are skills in	
which our	which our	
undergraduates	undergraduates	
must exhibit	must exhibit	
competency as	competency as	
working	working	
chemists.	chemists.	
	Analysis was	
	done using the	
	methodology	
	described	
	above by	
	evaluating their	
	research skills	
	in their	
	presentation	
	via quality of	
	their data	
	collection/anal	
	ysis and how it	
	was concluded.	
	A rubric was	
	utilized to get	
	the findings.	

Table 2. Continuous Improvement Results Since Last Report

Stage 4: ACT		
Actions/Goals Based on Data Results	Status	Discussion of Status
*Copy last cycle's actions/goals and report on	C=Complete	If C, describe efforts that led to accomplishment of
progress toward continuous improvement on those	P=Progressing	actions/goals.
here.	N=No Action Taken	If P, provide update on progress made toward
		accomplishing actions/goals and what tasks
		remain
		If N, discuss why action toward accomplishing
		actions/goals has been delayed and what work will
		be initiated toward accomplishment.
The goal is to provide students with the skills		
required for them to succeed as working chemists.		
Outcomes include demonstrating competency in	P	We will continue our actions to evaluate oral
oral communication skills, expertise in standard		communication skills (described in table 1).
scientific writing and use of English in preparing		Comparing with the previous evaluation year there
reports and effectively perform research at an		is no change however we plan to increase the
introductory level.		benchmark expectations in the next year.
		According to this year's results from the rubric,
		comprehension was the weakest component of
		those evaluated. We will mainly focus on
		improving understanding/comprehension next
		year.
		We will continue our actions to evaluate writing
		skills (described in table 1). The assignments to
		evaluate writing skills were more focused on
		biochemistry topics this year. The action plan is to
		have two tracks of topics to be covered, one with
		more focus on chemistry and the other one on
		biochemistry. We anticipate that this will impact
		the average score and the percentage of students
		who score 3.3 and above will increase. According
		to this year's results from the rubric, we will
		mainly focus on improving the quality of
		information presented in writing this year.
		Although the target was still not met, there was no

	significant change in student scores from 2021-2022 to the current 22-23 AY.  We will continue our actions to evaluate chemical research performance (described in table 1).  Comparing with the previous evaluation year, our students continued their excellent performance, therefore we plan to increase the benchmark expectations next year. According to this year's results from the rubric, the quality of data analysis was the weakest component. We will mainly focus on improving the quality of data analysis next year.  In addition, we plan to add tasks to evaluate some of the upper-level classes for scientific writing and oral communication skills in the future.