Annual Assessment Report
MS in Chemistry
AY 23-24

Program Information:

Name of Program: MS in Chemistry

Degree Type: Graduate

Coordinating Faculty: Michael Stevenson (mstevenson3@usfca.edu), Chemistry Graduate Program Director

Mission Statement: (No changes)

To deliver a broad-based, challenging research experience that will train students to participate effectively as Ph.D. researchers, health professionals, government and industry professionals, or as teachers. The program will foster a culture that values strong researcher-faculty-staff interactions and encourages researchers to become self-learners and to discover the excitement and creativity of chemical research. We strive to instill values of social responsibility with ethical behavior as part of a chemical research community culminating in the writing of a research thesis.

Program Learning Outcomes: *(No changes)*

1. Students will demonstrate a broad knowledge in areas of chemistry relevant to their research interests.
2. Students will become safe and proficient in laboratory practices and instrumental techniques necessary for their research area.
3. Students will be able to communicate the subject of chemistry, especially their own research project, in written and oral forms including: correspondence, reports and short presentations that may utilize multimedia tools that support effective communication.
4. Students will become critical thinkers who are able to judge scientific arguments and make their own arguments based on experiments conducted during their research project.
5. Students will graduate with an MS degree in chemistry from USF and be well prepared to pursue further graduate studies or employment in chemistry or related scientific fields.

Curricular Map: (No changes)

MS CHEMISTRY	PLG1	PLG2	PLG3	PLG4
Program Learning Goals X Courses	Students will demonstrate competency in two subdisciplines of chemistry relevant to their research goals.	Students will acquire and analyze data demonstrating safe, proficient laboratory practice / instrumental techniques, and analyze that data as necessary for their research area.	Students will be able to communicate their own research project, in written and oral forms.	Students will guide undergraduates in laboratory work
Courses of Program Requirement				
Entrance Examinations	I, D, M			
Opt 1: Diagnostic Test	x			
Opt 2: Independent Study	x			
Opt 3: Undergraduate Coursework	x			
CHEM 698 Graduate Research Methods		I, D, M	I, D	I, D, M
CLO1		x		
CLO2			x	
CHEM 699: Thesis Writing			M	
CLO1			x	
CLO2			x	
Teaching Assistantship				I, D, M
		Key: I = Introductory D = Developing M = Mastery		

Assessment Schedule:
F21 – PLO1
F22 – PLO3
F23 – PLO2
F24 – PLO3 (current)
F25 – PLO4
F26 – PLO 5

Program Assessment:

Assessment Methodology:

For AY 23-24, we chose to evaluate PLO3, which states that students will be able to communicate the research of their own project in written or oral forms. For this assessment, we decided to assess the oral form. Recently, a new requirement was approved for the MS in Chemistry program which directed all graduating students to present their research to the Department, and have it open to the University, in a seminar style format. Since there were four MS students who were writing their theses and preparing to graduate in either Spring or Summer 2024, these students presented their independent research on April 18, 2024 and May 2, 2024. Each presenter needed to follow the guidelines of an American Chemical Society (ACS) National Conference presentation of 18-20 minutes followed by questions and answers. It is worth noting that all graduate students attended the ACS National Conference in San Francisco in August 2023. Assessment was performed using the attached rubric which used a scale of 1 to 4 (generally, 1 = beginning or incomplete, 2 = developing, 3 = accomplished, 4 = exemplary). The 7-8 Chemistry faculty present at each talk completed the rubric for each speaker and returned to the Graduate Program Director who then tabulated the results.

Results:

Language Use and Delivery	**Student 1**	**Student 2**	**Student 3**	**Student 4**
Uses eye contact	3.75	2.86	3.63	3.88
Speaks clearly, effectively, confidently	3.88	3.71	3.88	4.00
Engages audience	3.75	3.14	3.43	4.00
Organization and Preparation				
Introduces topic clearly	4.00	3.71	3.75	4.00
Uses smooth transitions to connect points	3.88	3.67	3.63	4.00
Ends with logical and relevant conclusions	3.75	3.57	3.50	4.00
Slides are easy to read and understand	3.88	3.57	3.25	4.00
Content				
Communicates necessary background information	4.00	3.86	3.50	3.88
Explains why the topic is important	4.00	3.67	3.63	3.75
Defines questions addressed	3.88	3.57	3.75	3.75
Explains the technique(s) used	3.88	3.43	3.50	4.00
Explains data figures in detail	4.00	3.71	3.88	4.00
Shows how data support conclusions	3.88	3.43	3.75	4.00

As seen in the table above, all students presented their work at the accomplished or exemplary level. Of particular note is that the students introduced their research, provided sufficient background information, explained the techniques used, and the data itself. Importantly, all students effectively showed how their data support the conclusions made and explained the significance and importance of their work. These scores indicate that the Chemistry program and mentorship of these four graduate students has prepared them to effectively communicate their research.

Closing the Loop:

Although these scores are generally high and in the accomplished to exemplary category, there is room for improvement. Currently, students have the opportunity to present their work many times in the two-year program. Students present in Graduate Research Methods (CHEM 698) once per year, at CARD every Spring semester, and routinely in lab meetings. However, rubrics may not be used at all of the presentations. I will recommend that faculty use a rubric or similar feedback mechanisms to provide students with areas of improvement.

Student Presenter:_____

Language Use and Delivery: The student communicates ideas effectively

- Effectively uses eye contact
- Maintains eye contact
- Some eye contact but not maintained
- Uses eye contact ineffectively

- Speaks clearly, effectively and confidently using suitable volume and pace
- Speaks clearly and uses suitable volume and pace
- Speaks clearly and unclearly in different portions
- Fails to speak clearly and audibly and uses unsuitable pace

- Fully engages audience
- Takes steps to engage audience
- Occasionally engages audience
- Does not engage audience

Organization and Preparation: The student exhibits logical organization and presents clear slides

- Introduces the topic clearly and with ownership
- Introduces the topic clearly
- Introduces the topic
- Does not clearly introduce the topic

- Effectively includes smooth transitions to connect key points
- Includes transitions to connect key points
- Includes some transitions to connect key points
- Uses ineffective transitions that rarely connect points

- Ends with logical, effective and relevant conclusion
- Ends with a coherent conclusion
- Ends with a conclusion
- Ends without a conclusion

- All slides enhance presentation, are easy to read and understand
- 80% of the slides are easy to read and understand
- 50% of the slides are easy to read and understand; others have too much info, illegible font, or distracting animations
- 80% of the slides are difficult to read and understand; too much info, illegible font, and distracting animations

Content: The student effectively conveys the content and significance of the work

- Clearly communicates the necessary background for the topic
- Communicates the necessary background for the topic
- Communicates some background for the topic
- Does not include background for the topic

- Convincingly explains why the topic is important to study
- Defines why the topic is important to study
- Somewhat defines why the topic is important to study
- Fails to explain why the topic is important to study

- Relates the unknown portions of the topic to the questions addressed in the project
- Defines the questions addressed
- Lists the questions addressed
- Does not clearly introduce the questions addressed

- Effectively explains, in appropriate detail, the technique(s) used in generating the data
- Explains the technique(s) used in generating the data with partial detail
- Introduces the technique used in generating the data but does not explain the technique adequately
- Fails to clearly explain the technique(s) used

- Accurately explains at least one data figure in great detail
- Accurately explains one data figure in adequate detail
- Explains one data figure with some accuracy and partial detail
- Incorrectly explains the data presented in the figure.

- Clearly relates how the data support conclusion(s)
- Includes how the data relates to conclusion(s)
- Lists conclusion(s) but does not explain how data supports conclusion(s)
- Does not relate the data to the conclusion(s)

Additional comments for the presenter: