

Program-Level Assessment: Annual Report

Program Name (no acronyms): Chemistry MA	Department: Chemistry
Degree or Certificate Level: Graduate	College/School: Science & Engineering
Date (Month/Year): September 2023	Assessment Contact: Marvin Meyers
In what year was the data upon which this report is based collected? 2022-2023	
In what year was the program's assessment plan most recently reviewed/updated? 2018	
Is this program accredited by an external program/disciplinary/specialized accrediting organization? No	

1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please list the full, complete learning outcome statements and not just numbers, e.g., Outcomes 1 and 2.)

This is **Year 3** of a three year cycle. The Outcomes 3 and 5 were evaluated according to the program assessment plan.

Outcome 1: Demonstrate advanced level knowledge in both (i) synthesis and materials chemistry and (ii) analytical and physical chemistry methods, with a higher level of knowledge expected in the student's area of focus.

Outcome 2: Use standard search tools and retrieval methods to obtain information about a topic, substance, technique, or an issue relating to chemistry and assess relevant studies from the chemical literature.

Outcome 3: Communicate scientific findings from literature in written publications and oral presentations.

Outcome 4: Apply learned chemical practices and theories to proposed problems.

Outcome 5: Adhere to accepted ethical and professional standards in chemistry.

2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe the artifacts in detail and identify the course(s) in which they were collected. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

For Outcome 3, the overall score out of 100 points on a rubric for the research paper from CHEM 5470 Medicinal Chemistry was used. Criteria used for assessment was as follows:

>90% Exceeds expectations

70 - 89% Meets expectations

65 - 69% Approaching expectations

<65% Not meeting expectations.

For Outcome 5, we currently do not have a mechanism for assessment as these students do not normally take CHEM 5000 where research ethics are addressed.

No courses were offered online. Madrid does not have a graduate program in Chemistry.

3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (please do not just refer to the assessment plan).

Rubrics were used for all artifacts. These were completed by instructors for course work.

4. Data/Results

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

For Outcome 2, only 1 MA students enrolled in courses identified in our assessment plan 2020-2023. That student exceeded expectations.

For Outcome 5, we devote a class period in CHEM-5000, our introductory research course, devoted to discussion of research ethics. Students are given real world examples as pre-reading, preparing them to participate in discussion. The only student in this cohort did participate in this discussion as they started out in the MS/PhD program but switched to the MA program.

5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you?

The MA program is generally for part-time students who may be far removed from their undergraduate courses and have obligations in terms of work and/or family that impact their preparation for courses. Due to the small number of students in this program, it is difficult to do detailed breakdowns. We typically see variations in achievement for these students.

6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss these results and findings from this cycle of assessment?

The results and findings were communicated via the department's Microsoft Teams meeting portal and opened for discussion online and in the department faculty meeting.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies

- Course content
- Teaching techniques
- Improvements in technology
- Prerequisites
- Course sequence
- New courses
- Deletion of courses
- Changes in frequency or scheduling of course offerings

Changes to the Assessment Plan

- Student learning outcomes
- Artifacts of student learning
- Evaluation process
- Evaluation tools (e.g., rubrics)
- Data collection methods
- Frequency of data collection

Please describe the actions you are taking as a result of these findings.

We will develop a mechanism to assess research ethics (outcome 5) by incorporation into CHEM-5980 Graduate Reading which typically is taken in the last semester of the MA program.

If no changes are being made, please explain why.

7. Closing the Loop: Review of Previous Assessment Findings and Changes

A. What is at least one change your program has implemented in recent years as a result of assessment data?

We have not made any specific changes to our program based solely on the assessment data for the MA program.

B. How has this change/have these changes been assessed?

N/A

C. What were the findings of the assessment?

N/A

D. How do you plan to (continue to) use this information moving forward?

N/A

CHEM-5470 Research Paper Rubric

Name _____

Standards	5 - 4 Exemplary	3 - 2 Satisfactory	1 - 0 Weak	Score	Weight	Total Score
Introduction	Provides background research into the topic and summarizes important findings from the review of the literature; describes problem to be solved; explains the significance of the problem to an audience of non-specialists	Provides background research into the topic and describes the problem to be solved	Provides background research into the topic but does not describe the problem to be solved; insufficient or nonexistent explanation of details to non-specialists		x 3	
Discussion	Integration of Knowledge	Discusses at least four topics covered during the course. Demonstrates full understanding and application of concepts learned in course. Chemical detail of structures and discussion is accurate.	Discusses three topics covered during the course. Demonstrates satisfactory understanding and application of concepts learned in course. Chemical detail of structures and discussion are mostly accurate.		x 4	
	Depth	Paper presents a complete story of the discovery of the selected drug, including medical need, biological target or assay, medicinal chemistry optimization, and development.	Paper presents a partial story of the discovery of the selected drug.		x 4	
	Cohesiveness	Addresses the topic with clarity; organizes and synthesizes information; and draws conclusions	Addresses the topic; lacks substantive conclusions; sometimes digresses from topic of focus	Presents little to no clarity in formulating conclusions and/or organization		x 4
Summary	Presents a summary of the topic with clear recommendations and/or implications for future research	Presents a summary of the topic	Missing or does not summarize the topic		x 3	
Mechanics and documentation	Is free or almost free of errors of grammar, spelling, and writing mechanics; appropriately documents sources (ACS style)	Has errors but they don't represent a major distraction; documents sources	Has errors that obscure meaning of content or add confusion; neglects important sources or documents few to no resources		x 2	
Comments				Grand Score (max 100)		