

Institutional Effectiveness
2019-2020

Program ChemistryMS

College and Department College of Arts & Sciences Department of Chemistry

Contact: Jeff Boles

Mission: The mission of the graduate program in chemistry may be summarized as follows:

1. To provide an ongoing program of study that prepares graduates to successfully pursue scientific

SLO 3: prepare a hypothesis, design and execute experiments to test the hypothesis, keeping complete experimental records, (Assessment Item 14 on M.S. Survey of Graduates, M. S. Survey of Faculty). Surveyed annually and compiled every 5 years.

SLO 4: apply appropriate statistical analysis to collected research data, (Assessment Item 15 on M.S. Survey of Graduates, M. S. Survey of Faculty). Surveyed every 5 years.

SLO 5: apply critical thinking skills to further refine the hypothesis based on experimental evidence (Assessment Item 12 on M.S. Survey of Graduates, M.S. Survey of Faculty). Surveyed annually and compiled every 5 years.

SLO 6: effectively communicate scientific knowledge and ideas through both oral and written communication skills.

A departmentally developed curriculum map can be found in Appendix 1 that shows the connections between courses and student learning outcomes.

Assessment Methods:

PG 1: Engage students in research

1. SciFinder Scholar:

In order to assess our goal of increasing research productivity, SciFinder is used to determine the number of peer-reviewed publications in each two-year period. The chemistry department annual report is generated each year and contains tabulated data such as external funding dollars raised and numbers of manuscripts published via SciFinder Scholar to show progress in research productivity, in part funding outcome

2. Chemistry Department Annual Report:

Information in the Chemistry Department Annual Report provides annual tabulation of the results of each program goal (Indirect, but containing information from Direct Measure Assessment). The Chemistry Department Annual Report is used to not only track such data, but is also disseminated to the faculty and discussed at faculty meetings and retreats the other assessment tools. The graduate program is assessed by external review every 5 years.

3. Delaware Study

Information in the Delaware Study will be utilized to determine and tabulate the amount of external funds activated each year by the department. The University must file certain reports each year that indicate levels of funding support acquired from outside sources. The Delaware Report is thus very useful for acquiring this data.

PG 2: Decrease teaching load

1. Delaware Study

Information in the Delaware Study will be utilized to determine the actual teaching load assigned by the chair and the number of degrees awarded.

PG 3: Maintain a satisfactory graduation rate.

1. Graduation Rate

SLOs 6:

1. Seminar Evaluation Form

Both faculty and students attending student seminars fill out an evaluation form on the student speaker. This is helpful to both the student giving the seminar as well as the student grading the seminar. These are kept by the Seminar Program Coordinator, who also provides feedback to students, and to the M.S. Program Coordinator.

2. Chemistry M.S. Survey of Graduates

PG 3: Maintain a satisfactory graduation rate.

Academic Year	Number of Graduates
2007-2008	4
2008-2009	6
2009-2010	6
2010-2011	6
2011-2012	5
2012-2013	6
2013-2014	4
2014-2015	6
2015-	

Graduate Survey 2019-2020 Graduate Cohort

Item	N	1	2	3	4
13. Progress you made in learning to use the scientific literature	17	0%	0%	11.76%	88.24%

SLO 3: SLO3: design and execute experiments

Rubric for Faculty Evaluation of Thesis & Defense Problem

Year	Excellent	Good	Fair	Poor
2019	25%	62.5%	12.5%	0%
2020	57%	43%	0%	0%

Graduate Survey 2019-2020 Graduate Cohort

Item	N	1	2	3	4
14. Progress you made in learning to keep organized research/ laboratory records	17	0%	5.88%	11.76%	82.35%

SLO 4: Apply appropriate statistical analysis

Rubric for Faculty Evaluation of Thesis & Defense Problem

SLO 5: Apply critical thinking skills to refine the hypothesis

Appendices

1. Chemistry MS Curriculum Mapping
2. Seminar Evaluation Form
3. MS Survey of Graduate
4. MS Survey of Faculty
5. Graduate Advisory Committee Thesis Assessment

Appendix 1: Chemistry MS Curriculum Mapping

Chemistry, MS:
Mapping of the Graduate Curriculum and Student Learning Objectives

Appendix 2: Seminar Evaluation Form

(Evaluator: Please make comments in the space to the right of each category as part of your grade. If you take this form with you to fill out at your leisure, please return it to Kathy Rys by the following Monday)

Planning and preparation: Abstract clear, succinct, adequate detail in abstract and outline. Did the speaker adhere to outline?, etc	Award 1-20 points
Presentation to audience: Voice level and clarity, enthusiasm, eye contact, absence of annoying actions, proper use of notes, entertaining style, correct grammar, timing, well organized, professional demeanor	Award 1-20 points
Visual Aids: Relevance, effective use, quality, correct grammar, correct spelling, proper use of equipment, proper citations	Award 1-20 points
Subject matter: Knowledge about subject, presentation of scientific merit, use of literature, thorough understanding of material, etc	Award 1-20 points
Discussion: Interest aroused, ability to answer questions, adequate time allowed for questions	Award 1-20 points
General Comments:	
Total points:	

Appendix 3: MS Survey of Graduates

~~CHEMISTRY M.S. SURVEY OF GRADUATES (COMPLETED ONLINE WITH GOOGLE DOC)~~

Field of specialization: _____

Research Advisor: _____

Semesters in the M.S. program (counting summers): _____

Graduation Date (mm/yy): _____

Please rate your satisfaction or estimate the quality of the following items. Results will be kept anonymous

Not

	<u>Poor</u>	<u>Fair</u>	<u>Good</u>	<u>Excellent</u>
	<u>Applicable</u>			
Quality of courses in preparing me for my future	1	2	3	45
Quality of instruction in: Organic Chemistry	1	2	3	45
Analytical Chemistry	1	2	3	45
Inorganic Chemistry	1	2	3	45
Physical Chemistry	1	2	3	45
Biochemistry	1	2	3	45
Fairness in grading my courses	1	2	3	45
Availability of required courses	1	2	3	45
Opportunity for formal student evaluation of your instructors in chem courses		2	3	45

Assistance given by departmental secretaries	1	2	3	45
Quality of my initial contact with the department	1	2	3	45
Opportunity for student participation in departmental decisions	1	2	3	45
Overall quality of the department	1	2	3	45
Overall satisfaction with M.S. degree program	1	2	3	45

Please take time to share your thoughts and perceptions of the Chemistry Department in order to foster the improvement of its M.S. program and faculty.

List or discuss the strengths of the department, faculty, and degree program.

Appendix 4: MS Survey of Faculty

Chemistry M. S. Survey of Faculty

Please rate your satisfaction or estimate the quality of the following items. Your responses will be kept anonymous.

If you rate the program fair or poor on any of the items below, please use the text boxes at the end of the survey to elaborate on your rating.

	<u>Poor</u>	<u>Fair</u>	<u>Good</u>	<u>Excellent</u>
Not Applicable				Or
Perceived quality of instruction in graduate courses:				
Organic Chemistry	1	2	3	45
Analytical Chemistry	1	2	3	45
Inorganic Chemistry	1	2	3	45
Physical Chemistry	1	2	3	45
Biochemistry	1	2	3	45
Organization and clarity of M.S. degree requirements	1	2	3	45
Progress students make in learning to effectively use the scientific method		2	3	45
Progress students make in learning to effectively communicate scientific info		2	3	45
Progress students make in learning to think critically & analyze chem. probl (2)Tj 0.506 j 0.506 4mb1 (2na)2.6.3 (he. .6.54)	1	2	3	45

Quality of recruitment of M.S. students	1	2	3	45
Quality of <u>curricula</u> advising of M.S. chemistry students	1	2	3	45
Quality of <u>career</u> advising of M.S. chemistry students	1	2	3	45
Quality of <u>research</u> advising of M.S. chemistry students	1	2	3	45
Intellectual quality of entering students	1	2	3	45
Academic preparedness of entering students	1	2	3	45
Quality of efforts to prepare TA's for effective lab teaching	1	2	3	45
Appropriateness of number of T.A. stipends afforded to the program	1	2	3	45
Appropriateness of the amount of T.A. stipends	1	2	3	45
Level of operating budget afforded to the department	1	2	3	45
Quality of classroom facilities	1	2	3	45
Quality of laboratory facilities	1	2	3	45
Quality of TTU library chemistry holdings	1	2	3	45
Quality of computer support	1	2	3	45

Availability of a stimulating intellectual atmosphere conducive to learning	1	2	3	45
Availability of faculty development opportunities, sabbaticals, etc.	1	2	3	45
Assistance given by departmental secretaries	1	2	3	45
Opportunity for faculty participation in program decisions	1	2	3	45
Overall satisfaction with M.S. degree program	1	2	3	45

What are the major concerns that you have about the M.S. program that you wish to see addressed in this program review?

List or discuss the strengths of the department and faculty as they pertain to the M.S. degree program.

List or discuss the weaknesses of the department and faculty as they pertain to the M.S. degree program.

Any suggestions you may have to improve the M.S. program.

Appendix 5: Graduate Advisory Committee Thesis Assessment

Thesis /Research Defense Assessment

Student Name _____ Points _____

* Point Value	Thesis/ Problem/ Question	Information Seeking/Selecting and Evaluating	Analysis	Written Synthesis	Documentation	Oral Synthesis	Critical Thinking
4	Student contributed to thoughtful, creative hypotheses that engaged them in challenging or provocative research. The research breaks new ground or contributes to knowledge in a focused, specific area.	Student gathered information from a variety of quality electronic and print sources, including appropriate databases. Sources are relevant, balanced and include critical information relating to the thesis or problem. Primary sources were included.	Student carefully analyzed the information collected and drew appropriate and inventive conclusions supported by data.	Student developed appropriate structure for communicating data and conclusions, incorporating a variety of quality sources. Information is logically and creatively organized with smooth transitions. Little faculty assistance was required (mostly general editing).	Student documented all sources. Sources were properly cited in both written thesis and presentation slides. Documentation is error-free.	Student effectively and creatively used appropriate communication tools to convey their conclusions and demonstrated thorough, effective research techniques. Work displays creativity and originality.	Student demonstrated critical thinking by asking appropriate questions, considering legitimacy of sources and evaluation of data
3	Student contributed to focused hypotheses involving them in challenging research.	Student gathered information from a variety of relevant sources--print and electronic. Some were not very relevant.	Student conclusions shows good effort was made in analyzing the data collected	Student logically organized the methods employed and results generated. Average faculty assistance was required.	Student documented sources are sufficient in general. Few errors noted.	Student effectively communicated the results of research to the audience.	Student