



### MS Biological Sciences 2018-19 Learning Outcome Assessment Report

#### Learning Outcome 1 – Mastery of Field

##### Methods

We assessed students' mastery of their field using a survey distributed to the thesis committee within 10 days of the thesis defense. Questions on the survey addressing this learning outcome included "Mastery of Field" and "Mastery of Current Literature in Field", with students scored on a range of 1 (unsatisfactory) to 4 (outstanding).

To assure an adequate sample size and because previous years' data had not been reported, the 2018-19 assessment for Learning Outcome #1 included survey results for three students from 2017 and 2018. Scores were averaged across respondents for each of the two questions for each student; the percentage of students exceeding the minimum criteria (3.0) are reported here.

##### Results

Acknowledging a very small sample size, 67% of MS students completing their theses in Biological Sciences in 2017 and 2018 obtained a minimum mean score of 3.0 from their thesis committee members on the "Mastery of Field" and "Mastery of Current Literature in the Field" questions. The average score across the three students was 2.97 for "Mastery of Field" and 3.14 for "Mastery of Current Literature". However, the proportion of students (67%) meeting the minimum standard falls below our stated goal of 80%.

2018-19 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Field					
Student	1	2	3	Mean	
Mastery of Field	2.00	3.25	3.67	2.97	66.6667
Mastery of Current Literature	2.50	3.25	3.67	3.14	66.6667
				Total number of students	3
				Students scoring > 3.0 on Q1	2
				Percent of students, Q1	67%
				Students scoring > 3.0 on Q2	2
				Percent of students, Q2	67%

#### Learning Outcome 2 – Mastery of Research Design and Methods

##### Methods

We assessed students' mastery of research design and methods using a survey distributed to the thesis committee within 10 days of the thesis defense. Questions on the survey

addressing this learning outcome included “Mastery of Research Design” and “Mastery of Research Design and Execution”, with students scored on a range of 1 (unsatisfactory) to 4 (outstanding).

To assure an adequate sample size and because previous years’ data had not been reported, the 2018-19 assessment for Learning Outcome #2 included survey results for three students from 2017 and 2018. Scores were averaged across respondents for each of the two questions for each student; the percentage of students exceeding the minimum criteria (3.0) are reported here.

## Results

In 2017 and 2018, 100% of MS students completing their theses in Biological Sciences obtained a mean score of at least 3.0 from their thesis committee members on the “Mastery of Research Design” question, and 67% on the “Mastery of Research Design and Execution” question. The average score across the three students was 3.17 for “Mastery of Research Design” and 3.22 for “Mastery of Research Design and Execution”. The proportion of students (100%) meeting the minimum standard exceeds our stated goal of 80% for the “Mastery of Research Design” question (100%), but not for the “Mastery of Research Design and Execution” question (67%).

2018-19 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Research Design and Methods					
Student	1	2	3	Mean	
Mastery of Research Design	3.00	3.50	3.00	3.17	100
Mastery of Research Design and Execution	2.50	3.50	3.67	3.22	66.6667
				Total number of students	3
				Students scoring > 3.0 on Q1	3
				Percent of students, Q1	100%
				Students scoring > 3.0 on Q2	2
				Percent of students, Q2	67%

## Learning Outcome 3 – Mastery of Communication

### Methods

We assessed students’ mastery of research design and methods using a survey distributed to the thesis committee within 10 days of the thesis defense. Questions on the survey addressing this learning outcome included “Mastery of Communication” and “Mastery of Written Communication”, with students scored on a range of 1 (unsatisfactory) to 4 (outstanding). We also distributed an exit survey will be given to each student to report the number of national or regional conferences they attended, the number of posters or oral presentations given, and the number of publications they had submitted or accepted in peer-reviewed journals at the time of their defense.

To assure an adequate sample size and because previous years’ data had not been reported, the 2018-19 assessment for Learning Outcome #3 included survey results for three students



2018-19 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Communication					
Student	1	2	3	Mean	
# Meetings Attended	1	2	1	1.33	100
# Posters + Talks	1	0	1	0.67	66.6667
# Publications Accepted + Submitted	2	3	0	1.67	66.6667
Total number of students					3
Students with a meeting attended					3
Percent of students, meetings					100%
Students with a presentation					2
Percent of students, presentations					67%
Students with a paper					2
Percent of students, papers					67%

## Learning Outcome 4 – Mastery of Work

### Methods

We assessed students' mastery of their work using a survey distributed to the thesis committee within 10 days of the thesis defense. The question on the survey addressing this learning outcome included "Mastery of Work", with students scored on a range of 1 (unsatisfactory) to 4 (outstanding).

To assure an adequate sample size and because previous years' data had not been reported, the 2018-19 assessment for Learning Outcome #4 included survey results for three students from 2017 and 2018. Scores were averaged across respondents for each of the two questions for each student; the percentage of students exceeding the minimum criteria (3.0) are reported here.

### Results

Only two of the three (67%) MS students completing their theses in Biological Sciences in 2017 and 2018 obtained a minimum mean score of 3.0 from their thesis committee members on the "Mastery of Work" question; the average score across the three students was 2.92. This proportion of students meeting the minimum standard falls below our stated goal of 80%.

2018-19 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Work					
Student	1	2	3	Mean	
Mastery of Work	2.50	3.25	3.00	2.92	66.6667
Total number of students					3
Students scoring > 3.0 on Q1					2
Percent of students, Q1					67%

## 2019-20 Action Plan

As a consequence of the 2018-19 assessment results, three actions are planned for the 2019-20 academic year:

1. Continued and improved emphasis on student familiarity with the current literature and the major issues in their fields. Emphasis will take place in coursework where possible but also within individual laboratories.
2. Continued emphasis on communication of research by students, particularly oral communication in the form of presentations at meetings. We note a significant number of publications among the MS students, but fewer opportunities to present their research compared to our PhD students.
3. Continued and improved emphasis students' mastery of their work, as evidenced by their ability to openly reason and answer probing questions of their research.

### **Timeline for Action Plan**

A timeline for the implementation of the action plan for the 2019-20 academic year follows:

1. Student familiarity with the current literature and the major issues in their fields will continue to be emphasized in courses and individual laboratories. The department will emphasize the importance of these issues to all PIs having MS students in their labs, with significant improvements expected within 3 years.
2. The department will emphasize the importance of presenting MS students with oral opportunities to present their research beginning in Fall 2019.
3. Student mastery of their work will continue to be emphasized in courses and individual laboratories. The department will emphasize the importance of MS students' abilities to reason and answer questions about their research, with significant improvements expected within 3 years.