

**ASSESSMENT REPORT
2016-2017**

Natural Sciences: Biology
(Instructional Degree Program)

M.S.
(Degree Level)

Program Mission:

The mission of the Biology program is to provide undergraduate and graduate students with a high quality science education that includes experience with a research and field projects. The program provides a scientific and technical background that empowers students to successfully pursue science and technology careers, or, proceed on to advanced graduate studies.

Student Learning Outcome 1:

Have mastery of principle biological knowledge.

NMHU Traits Specifically Linked to Student Learning Outcome 1

- Mastery of Content Knowledge and Skills
- Effective Communication Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 1:

Course grades and evaluations; successful students will receive an average grade of “B” or better on class tests and/or projects in Biol 620 (Fall 2015) and Biol 610 (Spring 2016).

Summary of Data:

Number of Students Meeting Criterion:	10	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	12	Percent of Students Meeting Criterion:	83%

Second Means of Assessment for Outcome 1:

The general knowledge component of the thesis or project defense will be used as the assessment tool. Measure of success – 80% or more of our students will successfully meet our criteria.

Summary of Data:

Number of Students Meeting Criterion:	0	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	0	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 1:

Students in the MS Biology Program successfully met Student Learning Outcome (SLO) 1, mastery of principle biological knowledge, as demonstrated through course grades and evaluations. We actually did have one data point for the SLO 1 second means of assessment with one MS student who successfully defended a thesis over the reporting period. We will re-

evaluate our outcomes assessment plan in the following year (2017-2018) to determine if other metrics of biological knowledge can be included to ensure we have adequate means of assessing this SLO.

Student Learning Outcome 2:

Utilize scientific methodology and technology through which biological knowledge accumulates.

NMHU Traits Specifically Linked to Student Learning Outcome 2

- Effective Use of Technology

First Means of Assessment for Outcome 2:

Successful students will write an acceptable thesis proposal or project proposal and successfully defend it (B or better) in Biology 600 (Research Methods, Fall 2015).

Summary of Data

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	4	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2:

Course grades and evaluations of laboratory courses; Successful students will receive an average grade a “B” or better on laboratory reports and exams which include designing and carrying out experiments. Measure of success – 80% or more of our students will successfully meet our criteria. (Biol 585 and Biol 523 Spring 2016).

Summary of Data:

Number of Students Meeting Criterion:	11	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	11	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 2:

Students were successful at utilizing the scientific method and scientific technology in the MS Biology program as measured by well written thesis/project proposals and oral defense of the proposals. Students in laboratory courses demonstrated success in SLO 2 with acceptable grades on lab reports and exams. The Master’s program sufficiently prepares students for applying, and thinking with, the scientific method and scientific technology.

Student Learning Outcome 3:

Be able to critically analyze information and effectively impart biological knowledge with peers, mentors, and other professionals in the scientific community.

NMHU Traits Specifically Linked to Student Learning Outcome 3

- Mastery of Content Knowledge and Skills
- Effective Communication Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 3:

Thesis (or Project) and Defense; Successful students will write an acceptable thesis and pass their thesis defense.

Summary of Data

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	4	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 3:

Graduate Seminar-successful students will receive a “B” or better in the seminar Biol 650

Summary of Data

Number of Students Meeting Criterion:	7	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	7	Percent of Students Meeting Criterion:	100%

Third Means of Assessment for Outcome 3:

Course grades and evaluations for courses other than graduate seminar, particularly for courses involving written and oral reports; Successful students will receive an average grade of “B” or better for written and oral reports presented during these courses. Measure of success – 80% or more of our students will successfully meet our criteria. Biol 577, Biol 523, and Biol 585 (Spring 2016).

Summary of Data:

Number of Students Meeting Criterion:	11	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	11	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 3:

Students were successful in demonstrating their ability to critically analyze biological knowledge and communicate their findings effectively with peers and the scientific community. The Biology

Program allocates appropriate resources and attention to this SLO in courses and individual graduate student advising and preparation.

Student Learning Outcome 4:

Receive a comprehensive science background essential to advance to a doctoral program and/or career in biology or related fields.

NMHU Traits Specifically Linked to Student Learning Outcome 4

- Mastery of Content Knowledge and Skills
- Effective Use of Technology

First Means of Assessment for Outcome 4:

Tracking students receiving Master's Degrees in the program in the program using faculty knowledge. Measure of success - 75% of respondents indicating continuing their education or employed in biology or related area. 75% of the respondents will indicate that they are satisfied or very satisfied with their preparation for work or graduate school.

Summary of Data

Number of Students Meeting Criterion:	8	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 4:

Students in our program have successfully found employment in biology or gone on to advanced degree programs. Students met the SLO indicating appropriate program application to careers in biological sciences.

Utilization of Results:

The Biology Program will use these results in conjunction with program curriculum mapping this year to determine areas of improvement in student learning outcomes. We will use the collective information to develop a new outcomes assessment plan for the program by 2018.

Changes to Program Based on Results:

Biology graduate students successfully meet learning objectives of science content knowledge and the variety of skills we find critical for a career in biology. We plan to conduct curriculum mapping of our graduate courses during the 2017-2018 academic year to determine if there are areas of potential improvement in reinforcing major skills and concepts. Overall we did not find major deficiencies in Master's student SLOs. We would like to revise our outcomes assessment plan this coming year to include a metric of time to graduation to better understand the ongoing challenge of getting students to complete thesis writing within the two-year time frame. We may need to more closely assess sequencing of writing skills in our graduate course content during

curriculum mapping to address the delays in writing and graduation.

Retention Strategies:

The graduate program in Biology successfully retains students. Our greatest challenge is in getting Master's students to graduate within the two-year time frame. Many students complete course work within two years but take three or four years to finish thesis writing and finalize the degree. One new strategy employed this past year is to switch unproductive students over to a non-thesis option so they can finish in a timely manner. Thesis work is converted to a briefer Independent Research project and written up over a one semester time period. We hope to measure how this programmatic change affects our graduation rates in the coming years.