

**ASSESSMENT REPORT  
2020-2021**

**Natural Sciences: Biology**  
(Instructional Degree Program)

**M.S. (Non-Thesis/Thesis)**  
(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 representative graduate level courses: Biol 5350 (Mammology), Biol 5400, Biol 5760, Biol 6200, Biol 6350 (Medical Physiology); Biol 6400, Biol 6890, Biol 6200, Biol 5230, Biol 5810, Biol 5890. 80% or more students will meet our criteria for success

**Summary of Data:**

Number of Students Meeting Criterion:	25	Number of Students Not Meeting Criterion:	3
Total Number of Students Assessed:	28	Percent of Students Meeting Criterion:	89%

**Second Means of Assessment for Outcome 1:**

The general knowledge component of the oral thesis defense or comprehensive exit exam will be used as the assessment tool as either “pass” or “fail.” Measure of success – 80% or more of our students will successfully meet our “passing” criteria.

**Summary of Data:**

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	100%

**Interpretation of Results for Outcome 1:**

Students in the MS Biology Program successfully met the Student Learning Outcome (SLO) 1,

mastery of principle biological knowledge. Students evaluated on tests and projects in eleven 5000-6000 level courses demonstrated that 100% successfully met the criterion. Students evaluated through comprehensive exit exams demonstrated 100% met the criterion for success.

**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
- Mastery of Content Knowledge and Skills

**First Means of Assessment for Outcome 2:**

Successful students will receive a grade of “B” or better on the final research proposal in Biology 6000 Research Methods. Measure of success – 80% or more of our students will successfully meet our criteria.

**Summary of Data:**

Number of Students Meeting Criterion:	6	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	6	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 of “B” or better on laboratory reports which include designing and carrying out experiments. Biol 5350, 6350 Med phys Snow, Biol 6400, Biol 5810, Biol 5890. Measure of success – 80% or more of our students will successfully meet our criteria.

**Summary of Data:**

Number of Students Meeting Criterion:	6	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	6	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 research projects and oral defense of their research. The first means of assessment, earning a research proposal B or better grade in Biol 6000 was successfully met by all six students. Students in laboratory courses demonstrated success with acceptable grades on lab reports and exams. Level of success remains at 100% from the last 2018-2019 academic year assessment.

### **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 defense; Successful students will write an acceptable thesis and pass their thesis defense. 80% or more of our students will successfully meet our criteria.

### **Summary of Data:**

Number of Students Meeting Criterion:	na	Number of Students Not Meeting Criterion:	na
Total Number of Students Assessed:	na	Percent of Students Meeting Criterion:	na

### **Second Means of Assessment for Outcome 3:**

Course grades and evaluations for biology content courses involving written and oral reports; Biol 5350, Biol 5400, Biol 5760, Biol 6200, Biol 6350, Biol 6400, Biol 6890, Biol 6200, Biol 5810, Biol 5890. 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.

### **Summary of Data:**

Number of Students Meeting Criterion:	26	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	28	Percent of Students Meeting Criterion:	92 %

### **Interpretation of Results for Outcome 3:**

Students were successful in critically analyzing biological knowledge and communicating their findings effectively with peers and the scientific community. Data suggests that the Biology Program is effectively preparing our graduate students to be robust contributors to the greater scientific community. Sample size improved this year up to 25 students compared to 5 students for the second means of assessment, lending further support to the notion that MS program students are adequately prepared in critically analyzing and communicating their science. There were no thesis students graduating this academic year, in part due to the COVID 19 pandemic and the university, and our research labs, closing for a period of time. We did retain 8 out of 9 thesis students in the program despite the pandemic restrictions.

#### **Student Learning Outcome 4:**

Receive a comprehensive science background essential to advance to a doctoral program, professional 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 (last five year window). Measure of success - 75% of respondents indicate they are continuing their education or employed in biology or related area. 75% of the respondents indicate that they are satisfied or very satisfied with their preparation for work or graduate school.

#### **Summary of Data:**

Number of Students Meeting Criterion:	28	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	28	Percent of Students Meeting Criterion:	100%

#### **Interpretation of Results for Outcome 4:**

Students in our program that have graduated with a master's degree are currently working in a biology field or advanced degree. A substantial number of the students met the SLO indicating appropriate program application to careers in the biological sciences.

#### **Utilization of Results:**

The MS concentration in Biology program successfully prepares students with the targeted learning outcomes. Our program continues to build on success of past years and recently revised the non-thesis MS concentration in Biology degree program to increase the number of graduate students we can accommodate in our program.

#### **Changes to Program Based on Results:**

Recent changes to the program are a more streamlined non-thesis MS concentration in biology option to increase the 2-year graduation rate of students from our program. Overall, we did not find major deficiencies in Master's student SLOs and we will continue to monitor success after the new non-thesis MS addition to the program to gauge its efficacy.

#### **Retention Strategies:**

The graduate program in Biology successfully retains students. We have addressed the need to

increase student graduation rates from our MS program by streamlining the non-thesis option, which was successfully revised Fall 2018 and went into effect in Fall 2019.