LIFE SCIENCES - CONCENTRATION IN BIOLOGY - M.S. ASSESSMENT REPORT 2007-2008

I. Mission of the Program

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.

II. Program Goals

Our overall goal is to develop broadly literate students with a comprehensive knowledge of the biological sciences with the ability to critically analyze and apply their knowledge to the world around them. More specifically for our graduate program, our goal is to produce students who can successfully complete a research project and who are prepared for a career in biology or a related field or entrance into a Ph.D. program.

III. Program Student Outcomes

A student receiving an M.S. in Life Science with a concentration in biology will:

- 1. Have mastery of principle biological knowledge.
- 2. Utilize scientific methodology and technology through which biological knowledge accumulates.
- 3. Be able to critically analyze information and effectively impart biological knowledge with peers, mentors, and other professionals in the scientific community.
- 4. Receive a comprehensive science background essential to advance to a doctoral program and/or career in biology or related fields.

IV. Means of Assessing if Student Outcomes for the Program are met

1. Have mastery of principle biological knowledge

First Means of Assessment for Outcome Identified Above:

1a. Means of Program Assessment & Criteria for Success: Course grades and evaluations; successful students will receive an average grade of "B" or better on class tests. The final exam or project in Life Science 600 (Research Methods) and Life Science 640 (Advanced Cell Biology) will be used as assessment tools this year.

Second Means of Assessment for Outcome Identified Above:

1b. Means of Program Assessment & Criteria for Success: Comprehensive written exam over coursework will be designed by Biology faculty using relevant questions from the GRE Biology subject test. To successfully complete the exam the student will need a score of 70% or better. The GRE will be required for all new M.S. applicants starting in Jan 2008.

2. Utilize scientific methodology and technology through which biological knowledge accumulates.

First Means of Assessment for Outcome Identified Above:

2a. Means of Program Assessment & Criteria for Success: Thesis and Thesis Defense; Successful students will write an acceptable thesis and pass their thesis defense.

Second Means of Assessment for Outcome Identified Above:

2b. Means of program Assessment & Criteria for Success: 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. The laboratory project report due at the end of LSci581 (Developmental Biology) and LSci535 (Functional Genomics) will be used as assessment tools this year.

Third Means of Assessment for Outcome Identified Above:

2c. Means of Program Assessment & Criteria for Success: Grades for Team Problem Sets and research paper presentation in Advanced Cell Biology (LSci640); Successful students will receive an average grade of "B" or better on problem sets and research paper presentations.

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

First Means of Assessment for Outcome Identified Above:

3a. Means of Program Assessment & Criteria for Success: Thesis and Thesis Defense; Successful students will write an acceptable thesis and pass their thesis defense.

Second Means of Assessment for Outcome Identified Above:

3b. Means of Program Assessment & Criteria for Success: Graduate Seminar-successful students will receive a "B" or better in the seminar.

Third Means of Assessment for Outcome Identified Above:

3c. Means of Program Assessment & Criteria for Success: 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. The written report due at the end of LSci610 (Environmental Physiology) will be used as the assessment tool this year.

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

First Means of Assessment for Outcome Identified Above:

4a. Means of Program Assessment & Criteria for Success: Tracking students receiving Master's Degrees in the program in 2007-2008 using a modified student satisfaction survey with 75% of respondents indicating continuing their education or are employed in biology or related area (survey modified and administered in Fall, 2007). 75% of the respondents will indicate that they are satisfied or very satisfied with their preparation for work or graduate school.

V. Summary of Data Collected from the Means of Assessment

1. <u>Have mastery of principle biological knowledge</u>.

1a. 100% (13/13) of students in LSci600 and 89% (8/9) in LSci640 received a "B" or better.
1b. We have not developed a comprehensive written exam. The GRE is now required for admission into our Life Science Biology program.

2. <u>Utilize scientific methodology and technology through which biological knowledge accumulates.</u>

2a. Three students wrote and successfully defended their thesis. Two other students successfully completed their oral thesis defense and are working on final thesis corrections.

- 2b. Neither Developmental Biology and Functional Genomics were offered in the Spring of 2007 because of a shortage of faculty so we have substituted Environmental Physiology (LSci610) for this criteria. 100% (14/14/) received a "B" or better.
- 2c.100% (9/9) received a "B" or better on team problem sets and paper presentations in Advanced Cell Biology.
- 3. <u>Be able to critically analyze information and effectively impart biological knowledge with peers, mentors, and other professionals in the scientific community.</u>
 - 3a. Three students wrote and successfully defended their thesis. Two other students successfully completed their oral thesis defense and are working on final thesis corrections.
 - 3b. 100% (13/13) received a "B" or better n LSci650 Graduate Seminar
 - 3c. 100% (14/14/) received a "B" or better in Environmental Physiology including their final report
- <u>Receive a comprehensive science background essential to advance to a doctoral program</u> and/or career in biology or related fields.
 4a. Waiting for survey results

VI. Use of Data Results

Our graduate students met our criteria for success for all of our objectives. However, we feel that there is still room for improvement in terms of writing skills. Several of our graduate classes require some type of written reports and/or research papers and students are required to turn in outlines, rough drafts, and final papers to facilitate the writing process. We also continue to encourage students to use the writing center and to take Technical Writing within the English Department if warranted. This year Dr. Edward Martinez is devoting more time in Research Methods to thesis construction and writing skills.

The number of graduate students completing their degrees went up from one the previous year to three. We have several students that have defended their theses and passed their oral examinations that are still working on corrections. We continue to strongly encourage thesis advisors to work with students to get the thesis in a more acceptable format prior to the student's defense and physical departure from NMHU.