

ASSESSMENT REPORT 2017-2018

Chemistry Undergraduate
(Instructional Degree Program)

B.S.
(Degree Level)

Program Mission:

The goal of the chemistry Bachelor of Science degree program is to adequately instruct and engage the students with chemistry inside and outside of the department. The program is designed to prepare students for the rigors of a more advanced M.S. or Ph.D. program of study or direct entrance into the workforce. Course preparation and advisement are available for students who chose to enter a professional school to study for a career in an area such as medicine, veterinary science, dentistry, pharmacy, etc.

Student Learning Outcome 1:

NMHU Bachelor of Science Chemistry students should have the command of a basic body of chemical knowledge that is competitive with B.S. level chemistry students from any quality US University or institution.

NMHU Traits Specifically Linked to Student Learning Outcome 1

- Mastery of Content Knowledge and Skills

First Means of Assessment for Outcome 1:

The American Chemical Society produces standardized entrance examinations for general, organic, analytical chemistry, biochemistry, and physical chemistry. These examinations allow the faculty to compare the competence of our students with those at other institutions. Student outcomes are considered met if students score within one standard deviation of the average of National Raw Score Composite Norms for any particular ACS subject exam. The program goal will be considered met if the percentage of students meeting this criteria is greater than 60%. Below results from ACS Organic Chemistry Exam are presented.

Summary of Data:

Number of Students Meeting Criterion:	6	Number of Students Not Meeting Criterion:	1
Total Number of Students Assessed:	7	Percent of Students Meeting Criterion:	85.7%

Interpretation of Results for Outcome 1:

The percentage of students meeting this outcome was above our target. However this is consistently one of the criteria that is hardest to meet in our assessment, and the program continues to assess new methods for increasing student success on these exams (SIL, supplemental tutoring sessions, study guides, etc.)

Student Learning Outcome 2:

NMHU Bachelor of Science Chemistry students should be able to analyze chemical problems and communicate appropriate solutions to the problem that utilize appropriate chemistry-related instrumentation.

NMHU Traits Specifically Linked to Student Learning Outcome 2

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

First Means of Assessment for Outcome 2:

A capstone course, Chemistry 495, Senior Chemistry Applications, consists of an open-ended advanced chemistry project and a series of oral and written examinations that are designed to reveal each student's overall understanding of chemistry. Student outcomes are considered met if students score a "B" or better for the capstone course. Student outcomes are considered met if students score a "B" or better for the capstone course. The program goal will be considered met if the percentage of students meeting this criteria is greater than 90%.

Summary of Data

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	3	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2:

Involvement of students in research projects allows the faculty to ascertain student achievement in the areas instrumentation usage, safety, problem solving, project completion abilities and the utilization of basic chemical knowledge. Student outcomes are considered met if students engage in research and present their findings at professional meetings, department seminars, or NMHU Student Research Day. The program goal will be considered met if the percentage of students meeting this criteria is greater than 50%.

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	10
Total Number of Students Assessed:	19	Percent of Students Meeting Criterion:	47.4%

Interpretation of Results for Outcome 2:

The first criterion was 100% met. The second criterion was close to our goal but not achieved. The engagement of our students in research and presentation of their projects should be a strength in the chemistry program. We will continue to improve it as new faculty expand their research programs and begin to take in more students.

Student Learning Outcome 3:

NMHU Bachelor of Science Chemistry students should be engaged with chemistry outside of the classroom.

NMHU Traits Specifically Linked to Student Learning Outcome 3

- Effective Communication Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 3:

The Chemistry Seminar class is a weekly opportunity for students to experience speakers from within the department as well as invited speakers from other institutions and laboratories. Attendance at these seminars is not required, but is a vital piece of the program's goal of engagement. This outcome is considered met if students (sophomore-senior) attend at least one seminar per academic year. The program goal will be considered met if the percentage of students meeting this criteria is greater than 60%.

Summary of Data

Number of Students Meeting Criterion:	11	Number of Students Not Meeting Criterion:	5
Total Number of Students Assessed:	16	Percent of Students Meeting Criterion:	68.8%

Second Means of Assessment for Outcome 3:

Research projects are another means for the program to extend chemical education

outside of the classroom. This outcome is considered met if Junior and Senior students are involved in research projects with the Chemistry Faculty. The program goal will be considered met if the percentage of students meeting this criteria is greater than 75%.

Summary of Data

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	5
Total Number of Students Assessed:	14	Percent of Students Meeting Criterion:	64.2%

Interpretation of Results for Outcome 3:

If criterion on seminar attendance was met, the second criterion on involvement in research needs significant additional efforts and bringing more faculty into chemistry program doing research with undergraduates.

Student Learning Outcome 4:

NMHU Bachelor of Science Chemistry graduates should be fully prepared to further their education in chemistry or related fields.

NMHU Traits Specifically Linked to Student Learning Outcome 4

First Means of Assessment for Outcome 4:

This outcome is considered met if graduating seniors submit an application for further education in chemistry or a related field. (e.g. M.S. or Ph.D programs in chemistry, professional schools, etc.). The program goal will be considered met if the percentage of students meeting this criteria is greater than 75%.

Summary of Data

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	4
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	50.0%

Interpretation of Results for Outcome 4:

This is an area that the chemistry program has identified for future improvement through advising and advertising of previous students success. Already there is improvement

from the previous years when the number was below 50%. However this criterion should be modified to include students who entered a workforce.