

ASSESSMENT REPORT 2016 - 2017

Forestry
(Instructional Degree Program)

B.S.
(Degree Level)

Program Mission:

Forestry is the application of scientific principles to the management of forest resources, including non-wood products. The mission of the Forestry Program at NMHU is to provide students the skills needed to excel in a natural resources management field of study by:

- Providing a broad-based undergraduate education in the Liberal Arts and Sciences;
- Promoting study and quality research in forestry and natural resource management and conservation sciences;
- Providing an understanding of the ethical and professional sustainable management of land systems;
- Providing a superior learning experience for students through dedicated teaching, hands-on learning, research, and commitment to the individual student; and
- Providing a combination of state of the art computer and science facilities and close access to a diversity of ecosystems for student experiential learning.

Student Learning Outcome 1:

Effectively describe and implement the process of scientific inquiry.

NMHU Traits Specifically Linked to Student Learning Outcome 1:

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

First Means of Assessment for Outcome 1 (SLO1a):

Design an experiment to examine an ecological question in FOR 231 (Terrestrial Ecology) and present this proposal to the class. Students must receive a grade of 70% or higher to be considered passing in this outcome.

Summary of Data:

Number of Students Meeting Criterion:	11	Number of Students Not Meeting Criterion:	7
Total Number of Students Assessed:	18	Percentage of Students Meeting Criterion:	61%

Second Means of Assessment for Outcome 1 (SLO1b):

Successfully design and describe the application of experimental design to a natural resource management problem. This design will be developed and presented in FOR 492 (Applied Forestry Research). Students must receive a grade of 70% or higher to be considered passing in this outcome.

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	9	Percentage of Students Meeting Criterion:	100%

Third Means of Assessment for Outcome 1 (SLO1c):

Final grade of B or better in FOR 310 (Biometrics and Mensuration)

Summary of Data:

Number of Students Meeting Criterion:	8	Number of Students Not Meeting Criterion:	3
Total Number of Students Assessed:	11	Percentage of Students Meeting Criterion:	73%

Interpretation of Results for Outcome 1:

We have set high standards for this outcome to reveal any weaknesses that students might have in this area. SLO1a and SLO1c suggest room for improvement in FOR 231 and FOR 310. Students at the 200 level often struggle with the development and testing of hypotheses and the identification of dependent and independent variables. This is the second exposure to experimental design in their programs, the first being a brief introduction in FOR 105. While this result is not surprising, there is still room for improvement. More time will be spent on setting up the hypothesis and experimental design exercise in FOR 231 next year. There is also room for improvement in FOR 310, as based on SLO1c. While only one student out of 11 did not pass FOR 310, this is a foundational course. Mastery of measurement skills in this course are critical to understanding and success in subsequent courses. Challenges with quantitative reasoning and math are a major factor in student performance in this class, and it will be necessary to begin addressing these issues with students elsewhere in the curriculum before they reach FOR 310.

Student Learning Outcome 2:

Effectively communicate scientific and resource management ideas, information, and results, as well as standards of professional ethics, both verbally and in writing, in a way that (1) demonstrates consistent logic; (2) is well organized; (3) states and defends a thesis; and (4) demonstrates competent use of language.

NMHU Traits Specifically Linked to Student Learning Outcome 2:

- Mastery of Content Knowledge and Skills

- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 2 (SLO2a):

Present the results of the capstone project to the FOR 492 Senior Research Project class. A passing grade for this measure is >70%.

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	9	Percentage of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2 (SLO2b):

Grade on final exam in Natural Resource Economics (FOR 305) which requires a comprehensive analysis and presentation of a complicated natural resource valuation and decision problem involving forestry resources. A passing grade for this measure is >70%.

Summary of Data:

Number of Students Meeting Criterion:	12	Number of Students Not Meeting Criterion:	4
Total Number of Students Assessed:	16	Percentage of Students Meeting Criterion:	75%

Third Means of Assessment for Outcome 2 (SLO2c):

Final grade of B or better in Professional Ethics (FOR 426).

Summary of Data:

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

Interpretation of Results for Outcome 2:

The results of Outcome 2 demonstrate forestry is meeting its program goals for this outcome. It reflects the ability of students to communicate clearly about a variety of subjects. The greatest room for improvement is in SLO2b where students are asked to conduct a multipart, long-term economic analysis of a resource-rich property. Students face both analytical and communication challenges in this assignment. Students have faced similar challenges in the past when this class was previously taught. We may need to reconsider where economics is taught in the overall curriculum and place it later after students have more exposure to the measurement and analysis of natural resources.

Student Learning Outcome 3:

Effective use of technology by competently using appropriate tools from forestry and its various sub-disciplines.

NMHU Traits Specifically Linked to Student Learning Outcome 3:

- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 3 (SLO3a):

Demonstrated competence in using basic measuring instruments in an introductory field-based course (FOR 200, Field Practices). Final grade in course of C or better.

Summary of Data:

Number of Students Meeting Criterion:	13	Number of Students Not Meeting Criterion:	1
Total Number of Students Assessed:	14	Percentage of Students Meeting Criterion:	93%

Second Means of Assessment for Outcome 3 (SLO3b):

Demonstrated competence in using forest measuring instruments in an intermediate field-based course (FOR 310, Mensuration and Biometrics). Grade in a hands-on practicum exercise of B or better and a final grade in the course of C or better.

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	6
Total Number of Students Assessed:	11	Percentage of Students Meeting Criterion:	45%

Interpretation of Results for Outcome 3:

NMHU students often show a high aptitude for using measurement instrumentation as demonstrated by the high success in SLO3a. When use of instrumentation is combined with analysis and quantitative reasoning, things become more challenging. As with SLO2c, our student preparation and ongoing exposure to math needs to be carefully considered to ensure this area does not prevent our students from completing the program with the requisite math skills.

Student Learning Outcome 4:

Mastery of Forestry knowledge and skills.

NMHU Traits Specifically Linked to Student Learning Outcome 4:

- Mastery of Content Knowledge and Skills

- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 4 (SLO4a):

Take a final comprehensive Forestry Exit Exam that includes questions from the four SAF core competency areas. A passing grade will be 70%. This exam will not impact student graduation but will be used for assessment purposes and will provide students the opportunity to provide feedback on the Forestry Program to Faculty. This Exit Exam will be accompanied by a debriefing with graduating students.

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	9	Percentage of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 4 (SLO4b):

Final grade of B or better in Forest Management (FOR 410).

Summary of Data:

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

Third Means of Assessment for Outcome 4 (SLO4c):

Final grade of B or better in Applied Forestry Research (FOR 492).

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	9	Percentage of Students Meeting Criterion:	100%

Fourth Means of Assessment for Outcome 4 (SLO4d):

Final grade of B or better in Natural Resource Law and Policy (FOR 330).

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	5
Total Number of Students Assessed:	14	Percentage of Students Meeting Criterion:	64%

Interpretation of Results for Outcome 4:

The results of Outcome 4 demonstrate forestry is meeting its program goals for this outcome. It reflects a high level of mastery of forestry knowledge ranging in scope from basic knowledge (exam) to the application of resource law and policy, and culminating with the integration of disciplines to create an integrated resource management plan.

Utilization of Results:

These outcome results suggest the program is generally meeting its goals. The very strong performance of all of the students in the final capstone course is strong evidence that the program is meeting its mission goals and providing a high quality forestry education that meets SAF standards. This is the first attempt to capture student outcomes at different stages in the program. The results suggest that while some students may not be proficient at certain skills early in the program, they all reach proficiency by the time they reach the capstone course. An ongoing challenge which is at the core of some deficiencies (e.g., SLO3b) is weak applied math skills. This was the first year Forestry implemented an exit exam and a student debriefing session as part of the capstone course. This was extremely valuable to understand what students perceived as the strongest and weakest aspects of the program. Consistently, hands-on field experiences were at the top of their lists. While many courses offer field trips and hands-on exercises, we will be even more conscious of incorporating these into the overall curriculum. This may mean the program must budget for more field experiences. Another discussion item with students was sequencing of courses in the curriculum. In particular, ensuring that students take Forest Management in the semester prior to taking the capstone course is critical to preparing them for the final integrative capstone project. For this reason, Forest Management was put into the fall 2017 schedule instead of spring 2018.

Changes to Program Based on Results:

Although all students are required to pass calculus or applied calculus in the Forestry program, many students struggle with basic math and quantitative skills and applying those skills to taking and interpreting measurements. This issue emerges in the low percentage of students meeting the criterion for **SLO3b** (45%) and in **SLO2bn** (75%). Due to the importance of strong quantitative skills to succeed in courses and professionally, the forestry program will focus on developing and reinforcing quantitative reasoning skills throughout the forestry curriculum.

We will begin by mapping these skills across the curriculum to ensure the same skills and concepts are being introduced and reinforced in consistent ways and to identify gaps or holes in where concepts or skills are being introduced i.e., we cannot assume they learned it in high school..

Retention Strategies:

The Forestry Program will revisit and revise course scheduling, curriculum changes (e.g., course numbering and offerings) and curriculum advising to create a more efficient and clear path for new and

transfer students to complete the forestry curriculum in a timely manner. The last major revision to the Forestry program was in 2014. This revision responded to a Society of American Foresters request to even out the distribution of courses from the 100 through the 400 level. We will be proposing a second set of revisions this year that are aimed at creating a more coherent progression of knowledge and skills, provide clearer guidance on prerequisites and encourage student cohorts in multiple classes.