

Assessment of Student Learning Plan (ASLP): Natural & Applied Sciences

2018-19 Academic Year

University of Southern Maine

A. College, Department, Date

College Lewiston Auburn College
Department Natural & Applied Sciences
Date May 29, 2019

B. Contact Person for the Assessment Plan

Name and title Blake Whitaker, PhD Associate Prof. & Chair NAS

C. Degree Program

Name of Degree Program Natural & Applied Sciences B.A.

D. Assessment of Student Learning: Program Assessment

Step 1: Identify the Student Learning Outcomes (SLO's)

- a. Are your student learning outcomes published on your department's website?
Yes/**No**
- i. If yes, please provide the url: _____
- ii. If no, please list 3-5 of the most important student learning outcomes for your program. **What will students know by the end of your program?**

NAS Program Learning Outcomes

1. Develop a thorough understanding of fundamental biological concepts including:
 - a. The building blocks of biological systems and the relationship between structure and function.
 - b. The flow of biological information within an organism.
2. Gain an understanding of science as a process rather than an accumulation of facts.
3. Learn about unifying themes within the field of biology.
4. Observe a subset of biological concepts in practice.
5. Gain personal experience in the process of scientific inquiry, including:

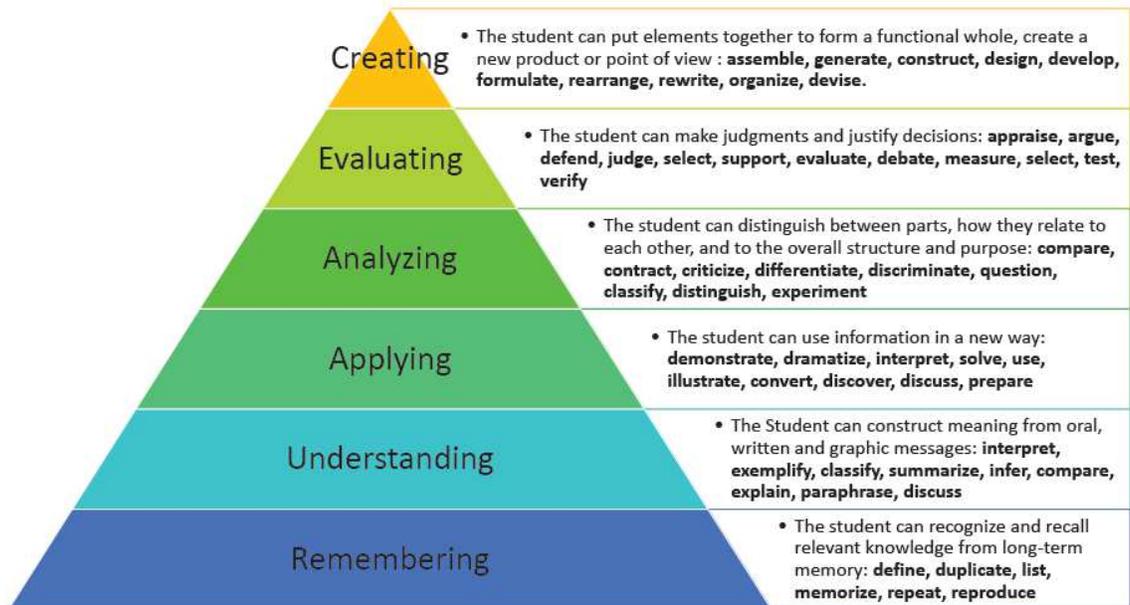
- a. Framing questions as hypotheses.
 - b. Experimental design.
 - c. Observational skills.
 - d. Objective analysis.
 - e. Communication of scientific findings.
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- b. *Please identify **which of your student learning outcome(s) were assessed this past academic year.***
 - c. *Do you have a **matrix or curriculum map** showing when your student learning outcomes are assessed and in which courses? Yes/No*
 - i. *If yes, do you have this map published on your website? Please provide the url or attach a copy of the curriculum map.*

Step 2: Assessment Methods Selected and Implemented

- a. ***Identify which assessment measures (beyond individual student grading) were used to determine whether students achieved the stated learning outcomes for the degree.** (NOTE: Many undergraduate programs are using their recently approved Capstone courses to assess student learning. Assessment plans included in your Capstone Proposal in the CCC may be referred to as examples of assessment work in your program.)*

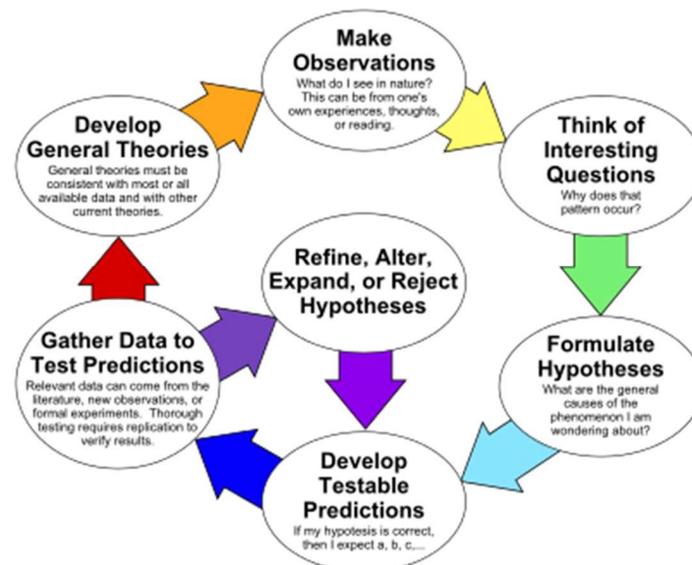
The Assessment of Student Learning Plans of the Natural & Applied Sciences (NAS) Program's curriculum and its students and graduates rests on the concept of authentic assessment as realized via the application of [Bloom's Taxonomy](#)¹ (below).

¹ Bloom, B. S.; Engelhart, M. D.; Furst, E. J.; Hill, W. H.; Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals*. Handbook I: Cognitive domain. New York: David McKay Company



The central approach to scientific discovery, the **Scientific Method**, makes application of this taxonomy to assess STEM learning practically automatic (see below). This approach to

The Scientific Method as an Ongoing Process



developing science “fact” via the scientific method is thoroughly described in all introductory NAS courses (<https://usm.maine.edu/nas/ba-natural-and-applied-sciences>) including SCI 105 Biological Principles I and SCI 170 Anatomy & Physiology I. Students are asked to understand, apply, evaluate, and synthesize new information as they progress through the NAS curriculum.

This is most emphatically demonstrated when students co-author scientific presentations and publications with NAS faculty.

- b. Briefly describe when you implemented the assessment activity; if a rubric or other structured approach was used to assess student outcome achievement, please describe and/or attach the rubric.*

Student outcomes were evaluated at the close of the Fall 2018 semester by applying Bloom's Taxonomy to evaluate the level of mastery of Outcomes 1-5 by students in SCI 105 and SCI 170 compared to those in the independent study section of SCI 305.

Step 3: Using the Assessment results to Improve Student Learning

- a. Briefly describe your unit's process of reviewing the program assessment results (for example, annual discussion by faculty committee, etc.).*

All NAS faculty regularly review student achievement in the two entry level course series: the Program Required SCI 105, 106, & 107 plus SCI 315 (for **general biology** and ecology); and the Optional SCI 170, 171, 172, & 173 plus SCI 305 (for **health sciences** majors). These learning outcomes then are reassessed in SCI 305 Molecular Physiology and SCI 315 Environmental Health.

- b. Identify the specific changes that have been or will be made to improve student learning based on these program assessment results. (For example, what changes will the program make at the assignment, course, or program level to improve student learning, based on the assessment results?)*

- A. General Biology will include additional policy discussion and review in light of revised EPA publication guidelines
- B. Health sciences is implementing case study review from the 100-level through the 300-level of courses

- c. Date of most recent program review/self-study? **2015***

E. Other Assessment Activities: Briefly describe any additional assessment-related activities your program is using at the course level (for example, creating common assignments and/or assignment rubrics for use across different sections of required courses, examining student progress in entry-level courses, other assessment projects implemented by individual faculty, etc.).

F. Community Engagement Activities in your departmental curriculum:

a. Does your department have a student learning outcome that is related to any community engagement activities? If so, please state the outcome.

b. Please indicate if any of the community engagement activities listed below are included in your program's curriculum, by noting which activities are required or optional for students in your major.

<u>Community Engagement Activity</u>	<u>Required/Optional</u>	
Student Research (related to a community-based problem)	R	O
Student-Faculty Community Research Project	R	O
Internship, or a Field Experience	R	O
Independent Study (community-related project)	R	O
Capstone Course (community-related project)	R	O
Service-Learning (course-based)	R	O
Study Abroad, or an International Program	R	O
Interdisciplinary Collaborative Project (community related)	R	O
Student Leadership Activities (related to a team project)	R	O
Students/Faculty Community Leadership (e.g., advisory boards, committees, conference presentations)	R	O
Other activities (please list):	R	O

c. Please list any courses (i.e. EDU 400) that have a community engagement activity in your program.

Entry-level courses: _____ Mid-level courses: SCI 240 Upper-level courses: SCI 355, SCI 360, LAC 470