

Assessment of Student Learning Plan (ASLP): Academic Programs

2017-18 Academic Year

University of Southern Maine

Reminder: All Department/Program Chairs will be responsible for completing an ASLP form by the end of this academic year for each academic program in your department. This campus-wide (annual) form is used to document the ongoing program assessment activities in each department/program. The form was designed to align with the NEASC accreditation- assessment standards.

If you have questions about this form, or need assistance with your program assessment plans during this academic year, please contact Susan King, Director of Academic Assessment, 780-4681, susank@maine.edu. Please email this form by May 31, 2018.

A. College, Department, Date

College CSTH
Department Mathematics and Statistics
Date May 31, 2018

B. Contact Person for the Assessment Plan

Name and title Laurie Woodman, Chair

C. Degree Program

Name of Degree Program B.A. Mathematics

D. Assessment of Student Learning: Program Assessment

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

- a. Do you have your student learning outcomes published on your department's website? No
 - i. If yes, please indicate 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?**

Over the course of studies as a mathematics major, students will be able to:

- 1) Translate problems into an appropriate symbolic representation and solve;
- 2) Solve problems using various techniques, in particular those of differential and integral calculus;
- 3) Reason logically and construct and evaluate proofs.

- b. *Please identify **which of your student learning outcome(s) were assessed this past academic year.** (One or more of the outcomes and corresponding assessment plans could come from your department's CORE Course Blueprint(s).*

Assessment of learning outcome #2 continued in 2017 and assessment of learning outcome #3 began in Spring 2018.

- c. *Do you have a **matrix or curriculum map** showing when your student learning outcomes are assessed and in which courses? No*

We have, however, identified courses in the foundations sequence where outcomes 1 and 3 are introduced (MAT 152 and 153), explored (MAT 350), and applied (capstone project).

Two of the discipline's specific foundational concepts/methods are:

a) Translate problems into an appropriate symbolic representation and solve (outcome 1).

This outcome is introduced in MAT 152 and 153 (Calculus A and Calculus B). Throughout these courses, students are introduced to the practice of translating a real world application into mathematical language. Furthermore, they identify what type of mathematical solution would be appropriate and practice these skills.

This outcome is explored in MAT 350 (Differential Equations) as students address more significant application problems and look at methods for solution. Emphasis is on the appropriate method given the mathematical expression of the problem.

These skills are applied in the capstone project. The problems which students will address in their projects will not be stated in mathematical language and will require the student to tie together significant content knowledge in the mathematical statement of the problem as well as the solution.

b) Reason logically and construct and evaluate proofs (outcome 3).

This outcome is introduced in MAT 152 and 153 (Calculus A and Calculus B) when students are exposed to direct proof through the definition of the derivative and integral.

This outcome is explored in MAT 290 (Foundations of Mathematics) when students use multiple forms for writing valid proofs, including but not limited to proof by contradiction, inductive proof, and proof by contraposition.

These skills are applied in the capstone project where students will be expected to select an appropriate method to prove and then present their results.

- i. If yes, do you have this map published on your website? Please indicate url or attach a copy of the curriculum map.*

Step 2: Assessment Methods Selected and Implemented

- a. Identify which direct measures (other than course grades), that were used to determine whether students achieved the stated learning outcomes for the degree.*

A rubric was created to evaluate the work collected during Spring 2018. The rubric was used to assess whether students achieved the learning outcome.

- b. Briefly describe when you implemented the assessment activity, and if a scoring rubric was used to evaluate the expected level of student achievement. (This information may be shown on your curriculum map).*

Outcome 3 was measured during the Spring 2018 semester for all students enrolled in *MAT 490 Topology*. Each capstone course project was reviewed and scored based on the rubric. Students also completed a questionnaire which included items about general education goals as related to their capstone course.

Example: Outcome 1 was measured during the fall semester -- all majors completed a problem-solving case study during the ___course. Case studies were graded on a rubric by two faculty members.

Example: Outcome 2 was measured during the spring semester -- all majors in the capstone course completed a research project. Research projects will be reviewed and graded by a group of faculty.

Step 3: Using the Assessment results to Improve Student Learning

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

Assessment results are shared with and reviewed by the appropriate departmental committee (Assessment, Capstone, Developmental Mathematics, Curriculum and/or Placement Committee). Proposed changes to improve student learning will be considered and implemented by the department, if approved.

- b. *What specific changes have been or will be made to improve student learning, as a result of using the program assessment results?*

Through these experiences faculty have learned more about the assessment process, including the importance of clearly articulated and measurable student learning outcomes.

Changes to the timing and implementation of the capstone project will be made in MAT 490.

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

In progress.

E. Course Assessment Activities: *Is your program able to report any assessment-related activities at the Course-Level... (i.e. created grading rubrics to use in required courses, examined student progress in entry-level courses, developed a new course, etc)? Please briefly explain any assessment projects.*

During the Spring 2018 semester, students in Developmental Mathematics courses (MAT 9, MAT 101), MAT 108, and MAT 120 were surveyed related to student satisfaction, specifically related to their placement.

Student progress in MAT 120 and MAT 108 is reviewed using common final exam questions.

Faculty from the department reviewed and analyzed reports on MAT 9, MAT 101, MAT 105, MAT 108, MAT 120, MAT 140 and MAT 152 prepared by the Office of Academic Assessment. Success rates and placement based on the Accuplacer Math Placement Exam, the College Level Math exam and SAT scores were considered. This data is being evaluated to determine appropriate levels for successful placement.

Faculty are in the process of developing a new Quantitative Reasoning course for students in Elementary Education Pathways, and a new pathway model for non-STEM majors, which includes a new course, MAT 100.

Faculty participated in the *Using Assessment Results for Course/Program Improvement* workshop at USM and the *Critical Thinking Across the Disciplines Statewide Workshop* at the University of Maine.

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? No. 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 (advisory boards, committees, conference presentations)	R	O
*An internship is required for students in the secondary education pathway.		
Other activities:		

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

Entry-level courses: _____ Mid-level courses: _____ Upper-level courses: MAT 366, 383, 460, 461
involve an optional community engagement experience.

Reminder: Please complete and submit this form by May 31, 2018.