**Learning Outcome Assessment Plan for the School of Biology.**

The School of Biological Sciences at the University of Utah is implementing a program-level learning outcomes assessment plan that aims to identify the standard of quality of our program.

Our school recently revamped its curriculum using input from all faculty within the school, and incorporated concepts and competencies raised by the Vision and Change document from AAAS. The instruction of the new curriculum uses evidence-based teaching methods that have proven to promote inclusive excellence and lead to higher learning. Our proposed new curriculum includes four new introductory courses and allows students to extend their focus in eight emphasis areas or remain in a program with broad training. The program lays out coherent plans of study that will help students to select logically connected courses among our many electives and are designed in manner that aims to meet our [program’s learning outcomes](https://catalog.utah.edu/#/programs/VkE_-j4C-?bc=true&bcCurrent=Biology&bcItemType=programs).

We plan to start collecting data for assessing the program-level learning outcomes for this new curriculum.  In the year 2019-2020, we have identified courses along various stages of our degree pathway and specific learning outcomes to assess for each of those courses. These courses and the learning outcomes being assessed for each course are listed below.

1. BIOL 1610 Fundamental of Biology-I, introductory biology freshmen level lecture course.

* Students will be able to apply a knowledge of genetics, gene expression, growth and development, signal perception and transduction, and physiological regulation to explain how information is stored, transmitted and utilized in biological contexts.
* Students will be able to apply biological concepts around environmental and human health to develop informed opinions on economic and societal issues.

2. BIOL 1615 Fundamental of Biology-I laboratory, introductory biology freshmen level laboratory course.

* Students will be able to apply the process of science to identify knowledge gaps, formulate hypotheses, and test them against experimental and observational data to advance an understanding of the natural world.
* Students will be able to evaluate the interactions between biology and society, including the societal impacts of biological research as well as public perception and decision-making about science, and clearly communicate biological concepts and their implications to broad audiences.
* Students will be able to apply concepts and sub-disciplinary knowledge from within and outside of biology in order to interpret biological phenomena, communicate with clear written and oral arguments, and work collaboratively to solve problems.

C. BIOL 2020 Cell Biology, a sophomore level course required for all biology majors.

* Students will be able to apply a knowledge of genetics, gene expression, growth and development, signal perception and transduction, and physiological regulation to explain how information is stored, transmitted and utilized in biological contexts.
* Students will be able to explain how biological units interact to give rise to emergent properties at multiple levels of biological organization. These interactions range from the cycling of matter and energy at the subcellular to organismal to biogeochemical scales to the interaction and interdependency of organisms, including humans, with their environment.

D. Biol 3525 Molecular Biology of DNA laboratory course for Juniors and Seniors.

* Students will be able to apply the process of science to identify knowledge gaps, formulate hypotheses, and test them against experimental and observational data to advance an understanding of the natural world.
* able to apply concepts and sub-disciplinary knowledge from within and outside of biology in order to interpret biological phenomena, communicate with clear written and oral arguments, and work collaboratively to solve problems.

E. Biol 5210 Cell structure function course for seniors specific to a few emphases.

* Students will be able to apply knowledge of molecular, cellular, and organismal structures to explain the diverse set of functions – ranging from the sub cellular to behavioral to ecological – that underlie the remarkable diversity of individual organisms as well as communities of organisms.
* Students will be able to explain how biological units interact to give rise to emergent properties at multiple levels of biological organization. These interactions range from the cycling of matter and energy at the subcellular to organismal to biogeochemical scales to the interaction and interdependency of organisms, including humans, with their environment.

For Biol 1610 we are assessing learning outcomes using a pre and post class assessment test that utilizes a published introductory cell and molecular biology concept inventory. Data is being collected and analyzed using the LASSO tool provided by the learning assistants program developed at University of Colorado at Boulder. For Biol 1610, we are also collecting individual assignment level data using the Gradescope grading software. For all other identified courses we are using the Associator and Reviewer tools developed by the Office of Undergraduate Studies. The tools will be embedded in the canvas courses for these classes and will allow us to collect learning outcomes assessment data at the assignment level.

The curriculum committee for the school will then review all the collected data and suggest changes and modifications to address quality shortfalls in the program. A similar but more expansive assessment plan will also be implemented in the 2022-2023 and 2025-2026 academic years.