Student Learning Outcome 1: An understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling

Course Instruction will be designed to meet this outcome by:

As part of this course, students will be exposed to numerous scientific concepts such as ecosystem interactions, nutrient/resource cycling, and fundamentals of energy. In doing so, they will be given the context for which this knowledge was obtained, such as observational studies, measurement of CO2 levels and temperatures, and measures of energy use and efficiency. Students will also examine mathematical models of climate change and projected resource availability and critique the viability of such predictions given the assumptions being made that allow for such predictions to be completed.

Students will be assessed through:

Questions of analysis and interpretation or graphs and data will be given in class, as well as on exams. During written assignments, students are expected to point out areas of weakness and limitations of methodologies pertinent to the conclusions being drawn. Additionally, students will engage in Thoreau walks which are designed to test their observational capabilities, as well as their ability to make predictions based on those observations and other scientific and societal knowledge.

Student Learning Outcome 2: Application of scientific data, concepts, and models in one of the natural sciences

Course Instruction will be designed to meet this outcome by:

Students will routinely utilize knowledge of concepts such as the hydrological cycle, ecosystem interactions, and current climate science to further their understanding of the complex systems that occur on the planet. As an example, by the end of the course, students will be able to name numerous threats to food supply chains that exist on a multi-national level, including climate change, monoculture susceptibility to disease, and loss of natural pollinators (as a few examples), and then utilize their knowledge of existing solutions to those and similar problems, and make suggestions for how we as a global society could act to safeguard against those concerns. This would draw heavily from biological and chemical knowledge gained during the semester.

Students will be assessed through:

Questions of scientific application are routinely asked in class and on exams. Additionally, the students are routinely assigned short essays or systems diagramming assignments that seek to address the interactions and application of scientific knowledge to problems faced by society, asking students to carefully examine the intersection of our scientific understanding of the world, along side the general views of society, and the real-world impact of human behavior.