On top of biology courses at Longwood University, students are also required to complete a handful of chemistry and physics courses in order to graduate. Being able to integrate these additional courses into the curriculum allows for a greater understanding of the field, as well as understanding scientific concepts at a more mechanical level. Through my Biology 251: Introduction to Ecology and Evolution and Biology 432: Freshwater Ecology courses, I was able to see how chemistry and physics play a deeper role in biological concepts.

In Biology 251, we were tasked with completing a semester long project of our choice. Here, my group and I decided to look at the effects of phosphorous supplementation on periphyton during the autumn season. Throughout the semester, we used bricks that had been left in Lancer Park Pond to access periphyton growth. Each lab period, we retrieved the bricks and added phosphorous. We then used combinations of acetone and other chemical compounds to properly retrieve data. We concluded that phosphorous had no effect on periphyton growth during the autumn season. While at first glance this may seem like a simple ecologically based experiment, a lot of chemistry and physics was involved. When initially placing bricks into Lancer Park Pond, we had to factor in the flow of the stream. If the bricks were placed directly in the center of the stream, running water would potentially wash any natural periphyton off that had accumulated. Instead, we placed the bricks in areas containing less movement in order to avoid this problem. Physics focuses on a lot of velocity and speed calculations and that situation was a perfect representation. Chemistry also came into play when conducting our experiment. A phosphate solution and deionized water were both used to help grow periphyton, as well as help filter excess gunk off of the bricks. These are both chemical compounds used in order to help retrieve data for the overall picture.

In Biology 432, our class was asked to determine the water quality of a local Farmville lake, Lake Lucy. The eight of us split up into 4 groups and decided to run different tests to help the lake owner understand what he had on his hands. Similarly, to Biology 251, my partner and I decided to do nutrient testing to determine the limiting factor of algal growth on the lake. In order to do this nutrient testing, we ran something called a nutrient bioassay. This is a more advanced form of water quality testing than that of my introductory level course. My partner and I sampled water throughout various weeks of the semester in order to get an accurate representation of the quality. After collecting water samples, we would add various nutrients such as nitrogen and phosphorous to our various treatment jars of lake water. After a week, samples were filtered and placed in acetone. Chlorophyll levels were then analyzed to determine if more algal growth occurred from the nitrogen or phosphorous treatments. While less physics was used in this experiment, more chemistry was involved. Nitrogen, phosphorous, and acetone were all used rather than just phosphorous and deionized water in Biology 251. The chemistry behind concepts such as predicting algal growth through nutrient loading and seasonal turnover allowed us to study more than just algal growth.

By looking at the chemical and physical aspects of biology classes, I was able to realize that there’s more to science than just biology. All different fields have to work together in order to properly compose experiments. I believe that looking at future studies through this lens will allow me to be a more well-rounded scientist overall.