Through Longwood’s curriculum, students have the opportunity to begin will introductory biology courses and work their way up to more complex subjects within. This has led me to be able to critically analyze and apply the major principles of cell and molecular biology. By taking Biol 250: Introduction to Genetics and Cell Biology and Biol 324: Genetics, I had the opportunity to develop a base of knowledge and move forward to really ask myself “What do these concepts mean?” Rather than memorizing information for a grade, I progressed to being genuinely interested in the work I was completing.

For my Biology 250 course, we were assigned to look at the microbial diversity in Buffalo Creek. In order to do this, we had to look at soil at the bottom of the sediment, versus the water running along the top. Our hypothesis was that bacterial diversity of the sediment at the bottom of the stream in Lancer Park would be greatly different from the water running along the top of the stream. Throughout this semester long project, I learned many basic laboratory skills that I had never used before. I learned how to perform genomic extraction, run PCR amplification, gel electrophoresis, and BLAST analysis. From this experiment we found that our hypothesis was only slightly proven. There were differences in the microbial diversity, but there were also similarities. Our hypothesis stated that the difference would be much greater. While my first artifact in this section shows the paper written based on our work, the third artifact gives a more visual representation through the poster that was created. Here, the information stays the same, but you are able to really understand the steps taken for each task performed. A little bonus is being able to view pictures of my partner and I really getting our hands dirty!

In Biology 324, we had a semester long project working with yeast. This however was working with beer yeast! My group decided to look at how mutations within gene expression caused a change in aroma for the beer produced post-fermentation. We hypothesized that targeting and overexpressing the ACC1 gene would cause a change in aroma after fermentation. Similar to Biology 250, PCR amplification and gel electrophoresis was used. What differed this time around was learning how to design a primer for our gene, transform the yeast, and then ferment the yeast. This was easily one of the hardest experiments of my college career due to the precision required and countless experimental mishaps throughout the process. What made it most difficult was not seeing the results that we had hoped for. It seems that something went wrong in the transformation process, which led to no colonies grown for fermentation. It was heartbreaking to see all of our work not turn out as hoped, but that’s just how science works. I won’t always get experiments right on the first try, but as long as I keep a positive attitude and continue to try new methods of improving my work that’s all that matters. My group was able to propose a new idea for future experimentation involving the swap of galactose for glucose in the pGAL promoter. Although we didn’t have time to retry the entire experiment, it was good knowing we bounced back.

By taking both of these classes, I believe I demonstrated tremendous growth within the major principle of cell and molecular biology. My knowledge continued to expand from my introductory level class through my upper level genetics course. Application is key and although I’m no professional in this field, I feel that these courses helped push me in the right direction.