

SAG Reflection
Jingyi Xu
Spring 2019
ISR - Machine Shop Practice

During my last semester at Olin, I've completed an Independent Study focusing on machining four projects in the shop. As a mechanical engineer, I consider the skill of machining to be very useful and valuable. Before this semester, I've only used a lathe, a mill or other tools occasionally for specific projects but I never felt like I had enough knowledge of or extensive experience with the machines. By doing a self-designed Independent Study, I was able to have a flexible schedule and devised projects based on my familiarity with the machines. As a result of this Independent Study, I became significantly more comfortable with and skilled at various machines in the shop.

My first project was a two slider that a hobbyist named Frank Ford designed. I chose this project mainly because Frank wrote a short tutorial on how to machine the components. The assembly includes five pieces in total, four of which need to be milled and one to be lathed. Most of the components require only basic operations such as facing, profiling or cutting slots and are made of aluminum or brass which are easy-to-machine materials. I didn't really want to challenge myself on the first project because I just wanted to get myself comfortable with the machines. I felt very satisfied when I finished the first project because I got to spend a lot of time in the shop and there was much fun and little stress.

My second project was on single-point threading which is making external thread on a shaft. This technique is not often required since we would generally use a die and it is much simpler and faster. However, when I was designing this Independent Study, it seems like a really cool technique and it will allow me to spend lots of time with the lathe. I got trained by shop instructor Nath Cantrell, completed a test piece and made my own two screws.

After the first two projects, I've got fairly used to operating machines for various parts. I moved on to my last two projects which were intentionally more challenging and allowed me to learn more advanced skills. The tape dispenser project required CNC milling and using a left-handed tool on the lathe. For the mini vise project, I had to machine stainless steel on mill which was extremely time-consuming. Some of the components were also of tight tolerance. I started to spend longer hours in the shop and do more difficult operations. I've run into problems that I've never seen before and shop instructors were extremely supportive and I've learned a lot from them.

This Independent Study not only allowed me to teach myself useful machining skills that are critical for mechanical engineering, but also, more importantly for me, increased my comfort and confidence level for operating machines. I am very thankful that I was granted SAG funding which made this Independent study affordable for me.