

Machine Shop

Part 1 – Facilities

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Introductory Medical Device Prototyping

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Safety Notice

- ▶ You must complete safety instruction before using tools and equipment in the Medical Device Center, ME Student Shop and CSE Workshops.
- ▶ All machinery can be dangerous. You must have a trained individual instruct you first when using unfamiliar equipment.
- ▶ Only authorized and trained individuals may operate CNC equipment.
- ▶ Code examples shown are for illustration purposes only, and are not meant for operation or programming actual equipment. They may be incomplete or contain errors.
- ▶ Always abide by shop safety instructions and never engage in horseplay.
- ▶ Remember to wear OSHA approved eye and ear protection in the shop, short sleeves, leather or steel toed shoes, and secure long hair, avoid loose clothing, and take off rings, watches and bracelets when using power equipment.
- ▶ These slides are part of the “Introductory Medical Device Prototyping” course at the University of Minnesota, and are not meant for any other purpose.

Eye Protection & First Aid



- Always wear OSHA approved eye protection.
- Familiarize yourself with the shop first aid kit, location of telephone, and emergency phone numbers.

Machine Shop Topics

- ▶ **Facilities**
- ▶ Hand Tools
- ▶ Machine Tools
- ▶ Mill
- ▶ Lathe

Student Shops

- ▶ Medical Devices Center
- ▶ Mechanical Engineering (aka CSE) Student Machine Shop
- ▶ Anderson Student Innovation Labs located in ME, EE and CE.

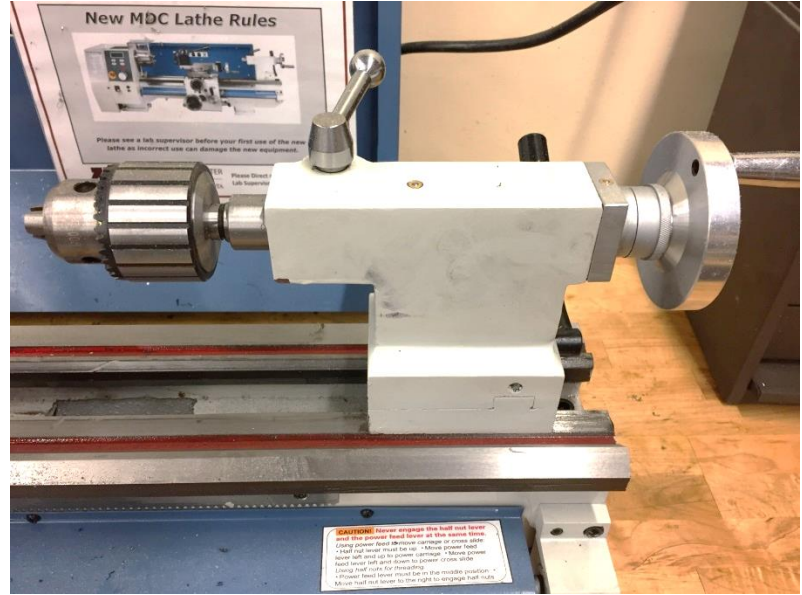
MDC Mechanical Prototyping



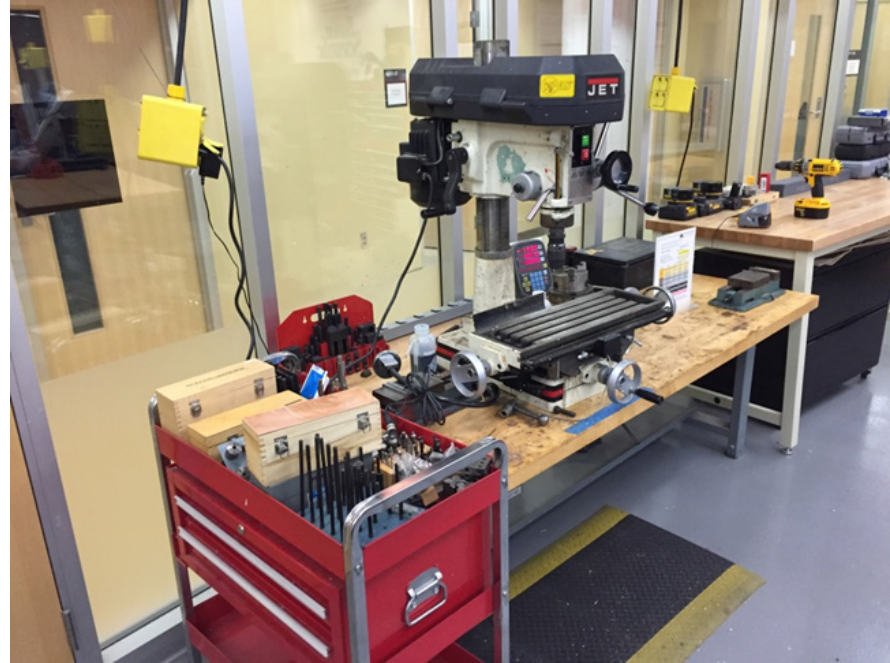
Lathe and 3-Jaw Chuck



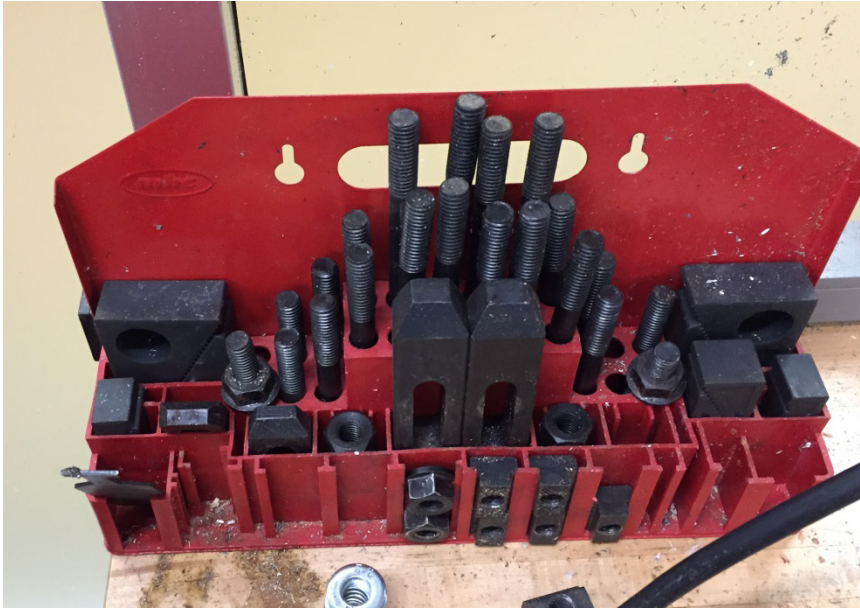
Lathe Carriage & Tail Stock



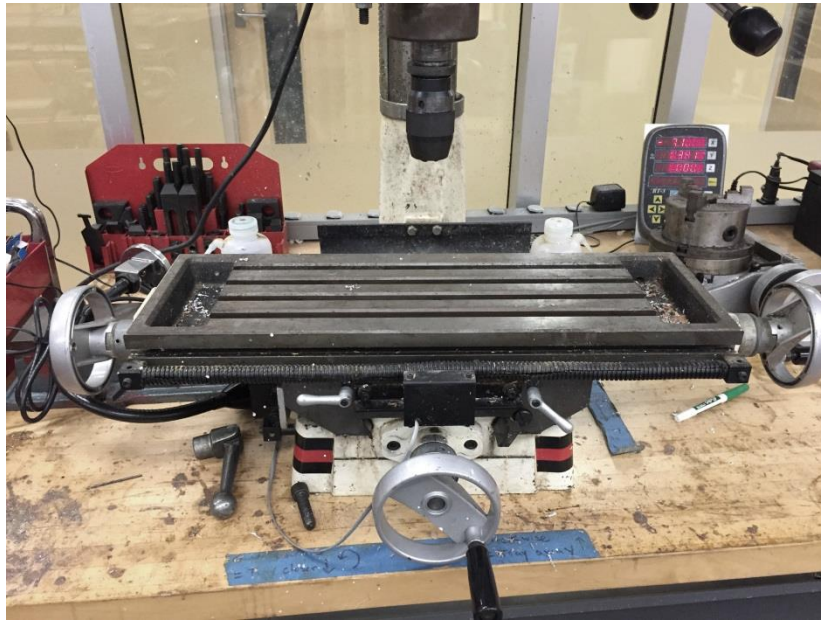
Mill



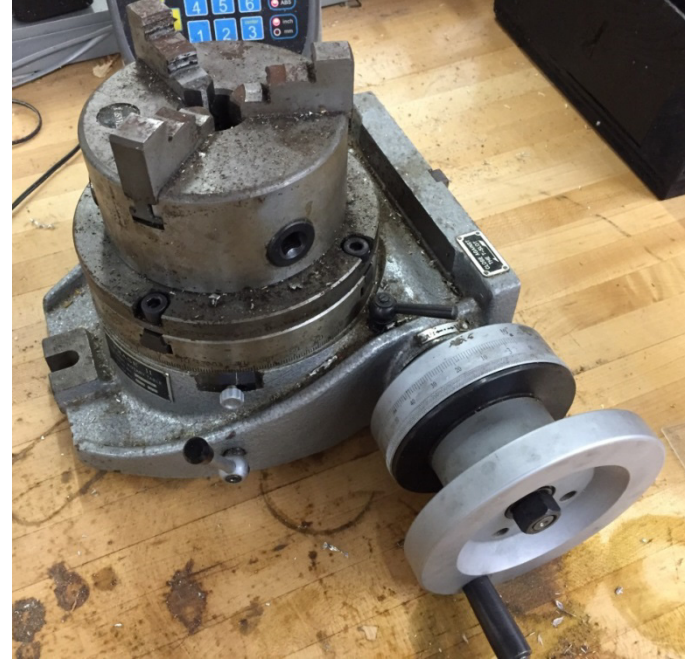
Mill Tooling



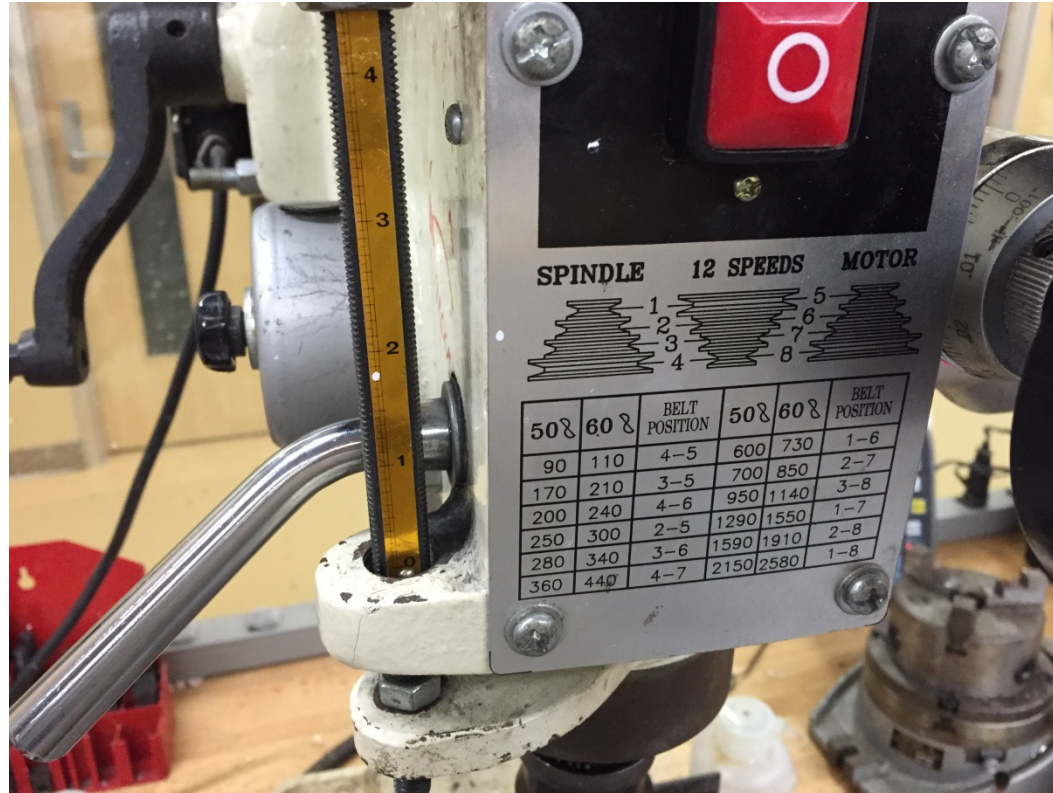
Mill Table & Digital Readout



Mill Vise & Rotary Chuck



Mill Spindle Speeds



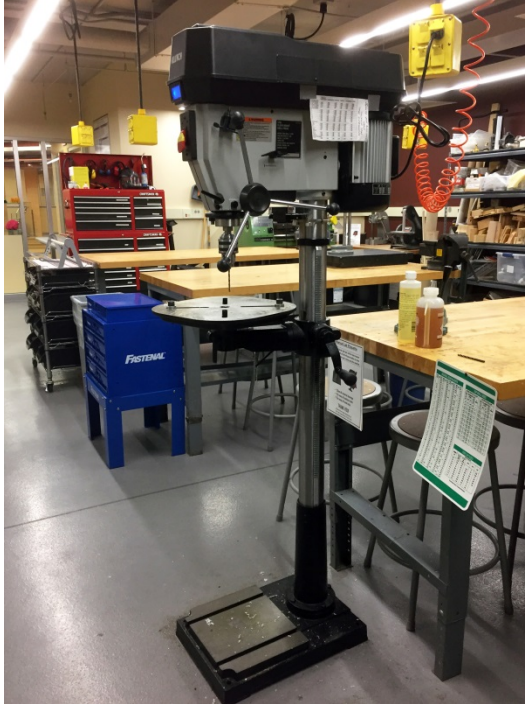
Mill Height Adjust



3D Printer & Laser Cutter



Drill Press and Arbor Press



Grinder & Sander



Band Saw and Cutoff/Drop Saws



Hardware Assortment



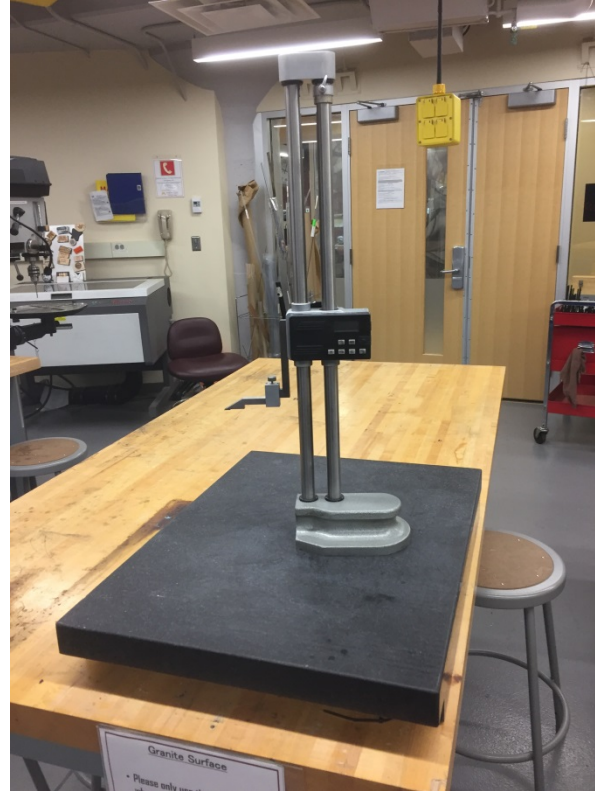
Hand Tools and Parts



Safety Hood & Glove Box



Height Gage & Granite Surface



ME Student Machine Shop



Mechanical Engineering Student Shop

ME 176

Hours: Monday- Friday
10:00 am – 6:00 pm

Peter Zimmermann

zimme049@umn.edu

Tel. (612) 625-7855

Student Workers:

Phillip Hoff Tel. (612) 626-0342

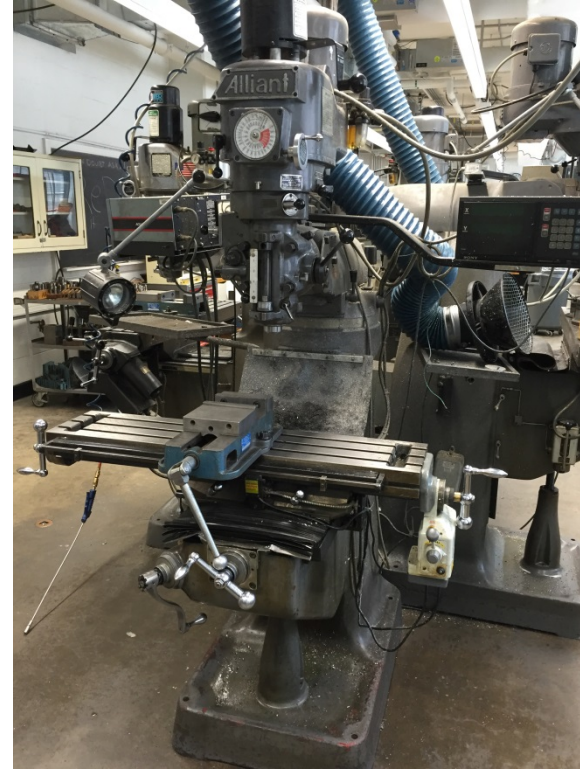
Evan Humphreys Tel. (262) 995-3667



Bridgeport & Alliant Mills



Watch
7m



Hardinge & Nardini Lathes



Tooling for Mill & Lathe



Band and Drop Saws



Belt Sanders



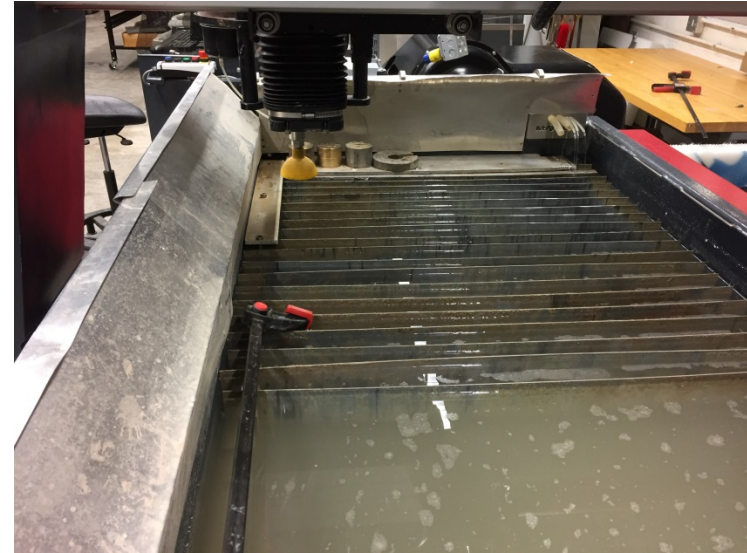
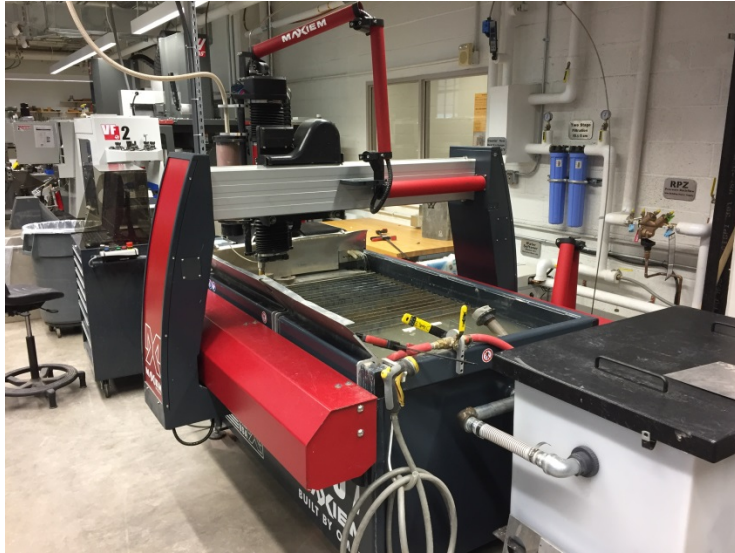
Deburring Rubber Wheel



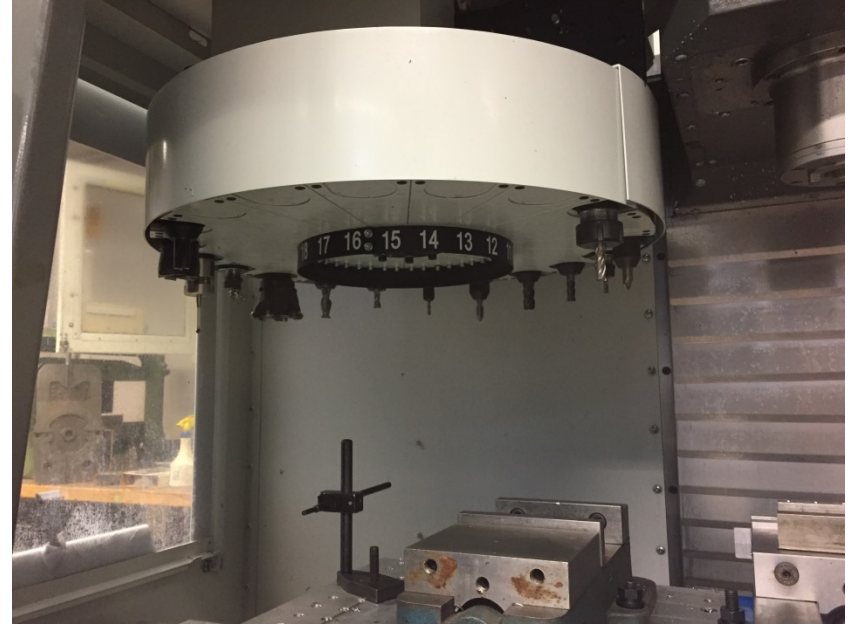
Shear & Horizontal Band Saw



WaterJet Cutter



HAAS CNC Mill



HAAS CNC Lathe



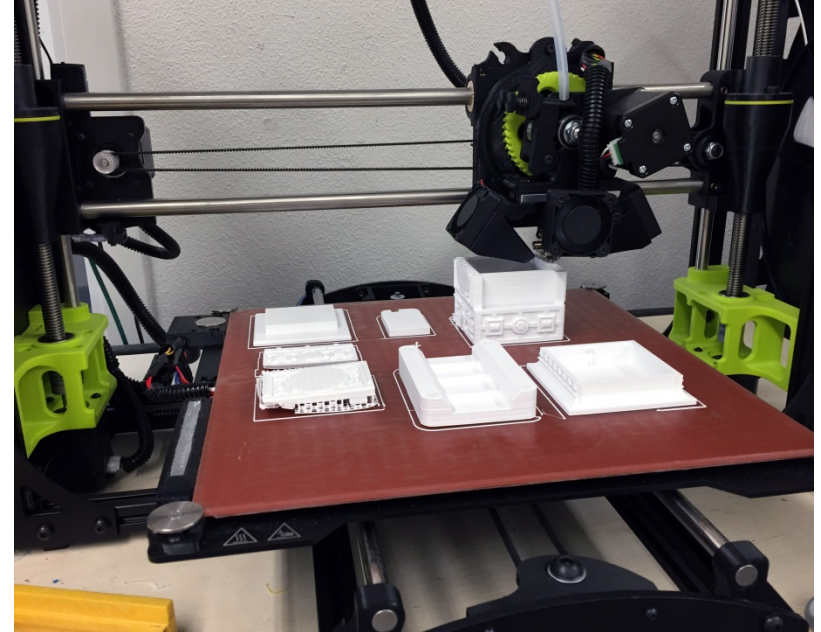
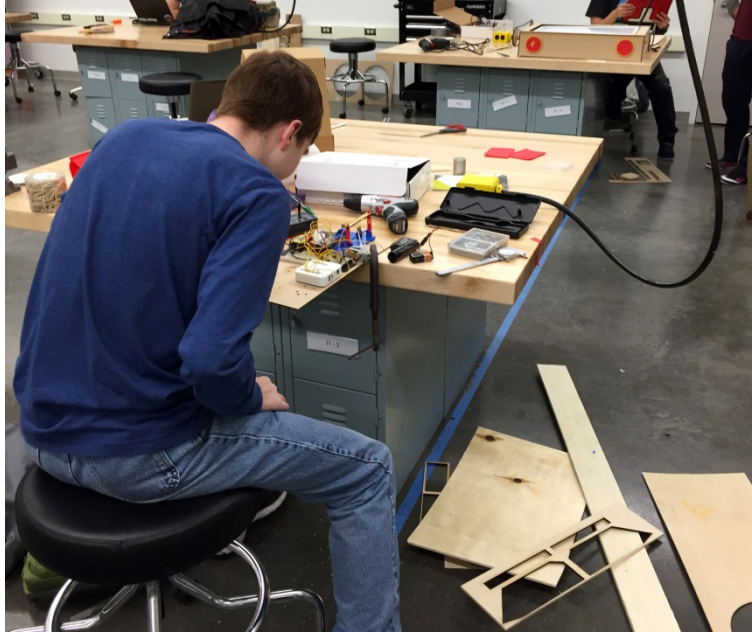
Anderson Labs in ME



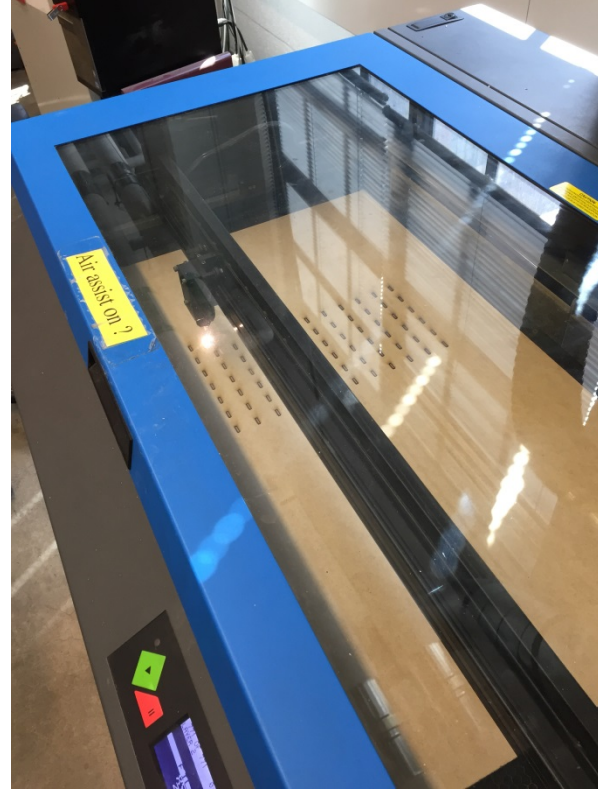
Work Stations



Assembly and 3D Printing



Laser Cutter



Summary

- ▶ Be sure to complete necessary safety training in each facility.
 - The MDC safety course is done on-line.
 - The CSE Student Machine Shop and Anderson Student Innovation Labs have their own forms and training that need to be completed.