

Basic Training

BAND SAW, DRILL PRESS, GRINDER AND HAND TOOLS

The purpose of this guide is to outline some of the basic knowledge for using the tooling in the Discovery Learning Laboratory.

The outcome of this qualification process is to have a safe and intact operating environment. THIS INSTRUCTION WILL HELP YOU KEEP YOURSELF SAFE IN A HAZARDOUS ENVIRONMENT. THIS TRAINING DOES NOT MEAN YOU ARE A MACHINIST!

REQUIRED PROPER DRESS

T-shirt or short sleeved shirt, long pants, closed toed shoes, safety glasses (found in shop)

Basic Safety and Operations

Where is the first aid kit?

What is the phone number for emergencies?

Describe proper clothing requirements.

Explain the prohibition of Alcohol or Drugs.

Describe the procedure for dealing with injury.

What is the procedure for dealing with health issues such as heart attack, stroke or latex allergy?

Describe fire fighting procedures. Where are the fire extinguishers?

Describe chemical or hazmat material spill containment.

Describe how to deal with a spill of a selected material like oil or paint.

What are the proper chemical storage procedures of flammables and oils?

What are the shop hours of operations?

What is the two person rule?

What materials may be worked within the machine shop?

What are the hazards of any machining process?

Describe what shop cleanliness means.

How are the machines and the shop cleaned after use? Pixies?

Measurements and Layout

Demonstrate the proper use and care of a micrometer.

Demonstrate the proper use a care of a caliper.

Demonstrate the proper care and use of a height gage.

Demonstrate the proper use of a rule and square.

Demonstrate the proper use and care of gage blocks.

Drill Press and Threading Operations

Observe one use of the Solberg drill. Note fixture. Note drill holders.

Describe the different types of drill holders

Show how to install a chuck

Demonstrate how to install a taper drill

Demonstrate the proper selection of feed and speed.

Demonstrate how to thread a hole.

Band Saw Operations

Observe use of the band saw.

Show the methods of adjusting the speed of the saw.

Be able to indicate the blade welder.

Demonstrate the proper use of the band saw.

Describe how to change a blade of the saw.

Demonstrate how to properly adjust the speed of the saw for a given metal.

Belt Sander

Observe use of the belt sander. Note the methods of adjusting the belt.

Demonstrate the proper use of the belt sander.

Show how to turn on the dust collector.

What are the dangers of the grinding process? (sparks and dust)

Epilog 36EXT Laser

How does a laser work?

How does a laser engrave?

What are the proper settings for engraving a piece of wood?

How is the exhaust system set up for engraving a piece of wood?

What are the proper settings for engraving a piece of acrylic?

How is the vacuum exhaust system set up for engraving a piece of acrylic?

How does a laser cut plastic?

What kind of plastics can the laser cut?

Can the Epilog 36EXT cut metal? Engrave metal?

Hand Tools

What is the difference between a Phillips and Slot screwdriver?

What does a box end wrench look like?

What is a crescent wrench?

What is the hazard of a chisel?

How do you clean a file?

Where is the sandpaper kept?

Where is paint or lubricants stored?

Technician Interactions

What is the proper way to gain someone's attention in a shop?

What is the proper method to utilize a machine that is obviously being used by someone?

What is etiquette for borrowing personal tools?

How do you know which tools are personal?

Training Videos from MIT

1 – Basic 1 Duration 40:32

<http://techtv.mit.edu/videos/142>

Layout Techniques

Basic Tools: Drill Press, Band Saw, Belt Sander & Grinder

Locating and Drilling Holes

Tapping Holes

2- Basic 2 Duration 57:33

<http://techtv.mit.edu/videos/130>

Drilling Holes

Special Drills for Plastics and Hard or Abrasive Materials

Drill Press Limitations

Band saw

Suitable Speeds, Feeds and Materials

Band saw Setup

Using the Drill Press Vise

3- Basic 3 Duration 30:02

<http://techtv.mit.edu/videos/181>

Good Practice - Clean Up

Small Belt Sander Configurations

Grinder Operations and Materials

Deburring and Buffing

Finishing Techniques