

# Team Neutrino

**FIRST Robotics Team #3928**

## **Team Neutrino #3928 Safety Manual**

2016-2017 Safety Captain: Joel Neppel

### **Member Responsibilities**

As a member of Team Neutrino you will be using dangerous equipment that could seriously injure you or someone else. It is your responsibility to help keep a safe environment. A few guidelines you should follow are:

- Read and understand safety documents
- Follow safety rules
- Wear the proper Personal Protective Equipment (PPE) when needed
- Use your brain! – many dangerous events can be prevented by using common sense and thinking about what you're doing
- Be aware of surroundings
- Make sure Mentor is present while when working on robot and using machines
- Notify mentor of any safety hazards and injuries

Anywhere you are, you should follow these guidelines to maintain a safe environment. Remember, safety starts with you!

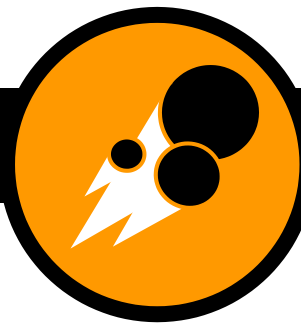
### **Personal Protective Equipment (PPE) and Proper Attire**

Your safety is very important! The first step towards keeping yourself safe is using the right PPE for the job

#### Eye Protection

Safety glasses are the most common PPE that protect from a variety of hazards and should be worn anytime when you are in a machine shop, using any machine or tool, working on the robot, in the pit, or in any other place where safety glasses are marked as necessary

- Safety glasses must be ANSI-approved (Z-87), UL Listed, or CSA rated
- If you have prescription glasses that are not approved, you must wear safety glasses that fit over them
- You may wear prescription glasses if they are safety rated and you have side shields.



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## Shoes

- Covers entire foot
- Closed toes and closed heels
- No sandals, flip-flops, or slippers

## Gloves

- Make sure gloves are correct size, have good flexibility, and do not have any holes
- Wear proper gloves for the job (chemical gloves while handling chemicals)

## What not to wear

- Loose baggy clothing
- Ties
- Jewelry
- Long hair not tied back

## **Machine Shop Safety**

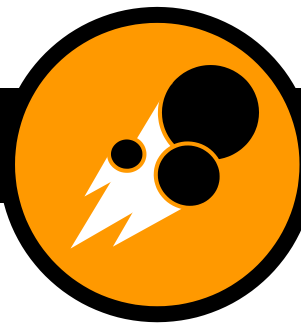
Since Team Neutrino works at Iowa State, we follow their safety training. All members of Team Neutrino are required to watch the Boyd Lab Shop Safety Fundamentals video and pass the test. In addition, any member wanting to use any machine in Boyd Lab must pass the test and have hands on training for every machine they wish to use.

## General

- Wear proper PPE and attire
- If you don't know how to do something or do not feel comfortable doing it, ask a lab technician for help
- Notify a lab technician if you notice something wrong with a machine (cord insulation punctured, blade broken/dull, mechanical guard missing)
- Keep floor and work table clean
- Plan your cuts before beginning
- Keep your hands a safe distance away from blades

## Mechanical Guards

Machine guards are vital to maintaining a safe working environment, and you should never use a machine that is missing guards or has damaged guards. Notify a lab technician if you notice that a guard is damaged or missing.



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## **Machine Safety**

### Band Saws

- There should be little resistance when using band saws, if you feel resistance ask a lab technician for help
- Blade guard should be 1/8 inch above workpiece

### Miter Saw

- Keep hands 4 inches away from blade
- Support ends of long workpiece with roller or table
- Lower the blade slowly and steadily

### Table Saw

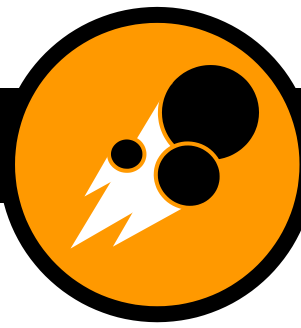
- Beware of kickback!
- Do not stand directly behind the blade, stand off to the side
- Do not use the miter gauge and fence at the same time
- Make sure fence is parallel to blade
- Avoid using knotted or warped wood and use caution when you must use it
- Keep hands 6 inches away from blade, use push sticks if needed
- Make sure the blade is 1/8 inch higher than workpiece

### Drill Press

- Use a vice to insure the workpiece will not move
- There should be little resistance when using drill press, if you feel lots of resistance stop and ask a lab technician for help

## **Hand tools**

- Use the right tool for the job
- Make sure tool is in good working condition
  - Blades are sharp (do not test sharpness with your fingers)
  - Cord undamaged (no cuts or holes in insulation)
  - Do not use a tool that is damaged, take the tool out of service and notify mentor to have it repaired or replaced
- Work on a hard surface, not the palm of your hand
- When using blades, cut away from yourself and away from others around you



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- Put tools back, with guards on blades, after you are finished
- Make sure tools are in a safe spot where it won't fall

## **Soldering**

- Be aware of where the solder is and be sure not to touch it
- Wear safety glasses
- Put soldering iron in protective holder when not in use
- Put solder in a place where it will not fall and others cannot accidentally touch it
- Work on fire resistant surfaces
- Wear long-sleeve cotton shirt for additional protection
- Only solder in well ventilated areas

## **Robot Safety**

### Working

- Always wear safety glasses when working on the robot
- If possible, set main breaker to off and disconnect battery
- Discharge pneumatics

### Operating

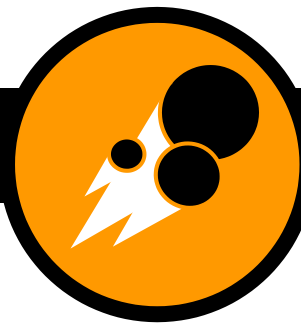
- If at any time you lose control or experience lag, disable the robot
- Be aware of the surroundings and keep people out of operation zone

### Transporting

- At least two people should carry the robot
- Lift with your legs, not your back
- Plan ahead where you're going to go and make sure the path is clear
- Disable/turn off robot (disconnect battery for long journeys)
- Make sure all parts are secure and will not fall
- Discharge pneumatics before transporting or storing
- Release any other stored energy (compressed/stretched tubing)

## **Resources**

FIRST safety manual: [www.firstinspires.org/resource-library/frc/safety-manual](http://www.firstinspires.org/resource-library/frc/safety-manual)



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To complete Boyd Lab safety training or review machine safety, login in with your account at: [www.ehs.iastate.edu/my-eh-s/training](http://www.ehs.iastate.edu/my-eh-s/training)

For information on batteries visit Johnson Controls battery MSDS:  
[www.johnsoncontrols.com/-/media/jci/suppliers/media-folder/supplier-expectations/batteries/safety-data-sheets/lead-acid-battery-021116](http://www.johnsoncontrols.com/-/media/jci/suppliers/media-folder/supplier-expectations/batteries/safety-data-sheets/lead-acid-battery-021116)