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TIERED ACCESS SYSTEM

- Red Training vs. Green Training
Basic Machine Shop Class
AKA – Green Training

- Mandatory one hour safety talk

- Cut all material for their project
  - Best done in groups of five or less

- Project can be one of:
  - 45 degree air engine
  - Cannon
  - Large vise
  - Plexiglass air engine
  - Small vise
Daily shop hours in the morning and afternoon

All hands-on, manual machining from here

Course has no time limit. It is finished when:
- Project is complete AND
- The student is competent in the use of machine tools

Class is a not-for-credit course
- It supports the experimental physics students, engineering students, and research groups.
LIMITED ACCESS SYSTEM

- SEAS Scientific Instrumentation Shop
Access during staffed hours
(consultation/observation)

Operation of the equipment only conducted by the professional staff (dedicated research operation)

All safety practices apply
SEAS Scientific Instrument Shop
Start with safety!
Design through production research projects
CNC Milling (3 and 4 axis)
CNC Turning
Water jet cutting – multiple materials
SolidWorks 3D modeling
MasterCam (computer aided manufacturing)
TIG Welding
Silver Soldering
Rules are for everyone from students to professors
- They must always be enforced

Machine Shop Inspections – EHS performs annual inspections to ensure policies are followed

Peer Inspections – Annual inspections performed by Harvard’s safety committee

Machine shop monitors are present until 8:00 PM-Student Shop Only

After 8:00 PM, students can work in student shop if:
- They are a Graduate Student, in SEAS or Physics, with Green certification
- A buddy is present
- NEVER alone!
Glass – As many windows and glass doors looking into your shop as possible
- Increases the number of folks aware of what is happening in your shop!

Shop office – Must be positioned to maximize the sightlines within your shop

Video Surveillance – Cameras should point to all areas
- Viewing should be possible from the shop’s office

Card access – Best way to control usage after hours
View from office looking into shop
Monitor view from office
Safety sightlines
DEALING WITH PHYSICAL CHALLENGES

- Keep your mind open
  - Most students know what they are capable of doing
- If adaptations are required work with the student to determine what works best for them
- If you are concerned about their ability to do something:
  - Ask them how they plan to approach the problem; their answer may surprise you!
- If they simply cannot perform an operation:
  - Discuss it with them
  - Saying they cannot perform a task could be hurtful
- **Patience, Patience, Patience:** Easier said than done

- **Don’t dance around questions:** If you don’t know the answer, admit it. Then research and find the answer

- **Your bad day shouldn’t be your student’s bad day:** Don’t take out your problems on your students. If you do, apologize to them afterwards

- **Keep it light - laugh and joke:** your students need to see that side of you
Other trainings we offer

- Prototrak Programming – Mill and Lathe
- TIG Welding
- Silver Soldering
- Laser Cutting - Plastic
- Laser Cutting – Metal
- 3D Printing
- Mastercam
Thank you!

Bottom Line – We do make a difference!

Questions?