Aerospace Engineering Machine Shop Basic Safety Course

I. Purpose:
This course is designed to familiarize students with much of the equipment in the Aerospace Engineering Instrument Shop. The course stresses safety to the user, proper and improper uses of equipment, and basic maintenance. Students who wish to utilize the shop in any fashion, whether that be use of hand tools, workbench space, or stationary machines, must take this course and sign a safety contract.

II. Basic Safety:
A. Wear safety glasses at all times (glasses provided)
B. Wear closed-toed shoes at all times (no sandals)
C. Tie back loose hair or clothing
D. Remove all jewelry (with the exception of wedding rings)
E. Be aware of and courteous to other shop users
F. NO drugs or alcohol

III. Machines & Tools:
A. Hand Tools & Workbenches
i) Location
ii) Safe use
B. Arbor Press
i) Used for pressing bearings in & out
ii) Shatter danger (eyes)
iii) Pinching danger (fingers)
C. Table Punch
i) Used for punching holes in sheet metal (1/16” or less)
ii) Acceptable items:
   a) Aluminum, Brass, & Copper < 1/16” thick
   b) Steel & Stainless Steel < 0.050” thick
   c) Rubber < 1/8” thick
   d) Plastics < 3/32” thick
iii) Non-Acceptable items:
   a) Wood
   b) Fiberglass
   c) Any abrasive material (ask supervisor if not sure)
   iv) Pinching Danger (fingers)
D. Foot Shear & Corner-Notcher
i) Used for shearing sheet metal
ii) Acceptable items:
   a) Aluminum, Brass, & Copper < 1/16” thick
   b) Steel & Stainless Steel < 0.050” thick
   c) Rubber < 1/8” thick
   d) Plastics < 3/32” thick
   e) Fiberglass (circuit boards) < 3/32” thick
iii) Non-Acceptable items:
   a) Wood
   b) Any abrasive material besides fiberglass (ask supervisor if not sure)
   iv) Never remove cutting blades!!!!
   v) Slicing Danger (fingers)
G. Press Brakes
i) Used for bending sheet metal
ii) Acceptable items:
   a) Aluminum, Brass, & Copper < 1/16” thick
b) Steel & Stainless Steel < 0.050” thick

iii) Remove press fingers only with supervisor permission

iv) Pinching danger (fingers)

v) Shatter danger (eyes)

H. Solvent tank

i) Used for cleaning metals of oils

ii) Clean ONLY metals with solvent tank

iii) Wipe or spray all excess chips off of part

iv) Use gloves

v) Close tank when finished

vi) Fire Danger

vii) Splatter Danger (eyes)

viii) Inhalation & skin absorption danger

I. Belt Sander

i) Used for removing burrs, creating radii, trimming to size

ii) Always keep guard on sander

iii) Clean sander after use (making sure to unplug while cleaning)

iv) NEVER wear gloves

v) Abrasion danger (fingers)

vi) Heat danger (fingers)

vii) Inhalation danger (lungs)

viii) Catch danger (hands)

ix) Noise danger (ears)

J. Pedestal Grinder

i) Used for grinding tools and occasionally hard metals

ii) DO NOT grind any material OTHER THAN hard metals

a) NO aluminum, brass, copper, wood, plastic, fiberglass, etc.

iii) Shatter Danger (eyes)

iv) Abrasion Danger (fingers)

v) Heat danger (fingers)

vi) Catch danger (hands)

vii) Noise danger (ears)

K. Horizontal Band Saw

i) Used for cutting large materials, long lengths, and round material

ii) Hold the material properly

iii) Choose the appropriate feeds & speeds

iv) Use mist coolant

v) Cutting Danger (fingers/hands)

vi) Catch Danger (fingers/hands)

vii) Crushing Danger (feet)

L. Vertical Band Saw

i) Used for cutting most materials precisely

ii) USE THE PROPER BLADE FOR THE MATERIAL

iii) Choose appropriate feeds & speeds

iv) NEVER wear gloves

v) Use mist or liquid coolant

vi) Use push sticks when close to blade

vii) Slicing danger (fingers)

viii) Inhalation danger (lungs)

ix) Noise danger (ears)

M. Drill Press

i) Used for drilling holes

ii) Hold the material properly

iii) Use the proper drill for the application

a) Sheet Metal

b) Brass
c) Center Drilling
iv) Choose appropriate feeds and speeds
v) Center drill when appropriate
vi) Use coolant
vii) Shatter Danger (eyes)
viii) Catch Danger (fingers/hands)
x) Ejection Danger (other shop users/body)

N. Other shop tools
i) Engine and tool-room lathes
ii) Milling machines
iii) CNC Milling machine
iv) Welder
v) Acetylene torch
vi) Use of these items MUST be directly supervised
vii) You must set up an appointment to use these machines
viii) Unsupervised use of these machines is at instructor discretion
ix) CNC Milling must ALWAYS be directly supervised

IV. Safety Contract:
i) You MUST read, understand, and sign the safety contract to use shop equipment
ii) Use of shop equipment without the supervisor’s presence in the shop is prohibited
iii) Let instructor know what machines you intend to use and for what purpose upon entering the shop
iv) Understand the shop priority schedule and how your project fits in